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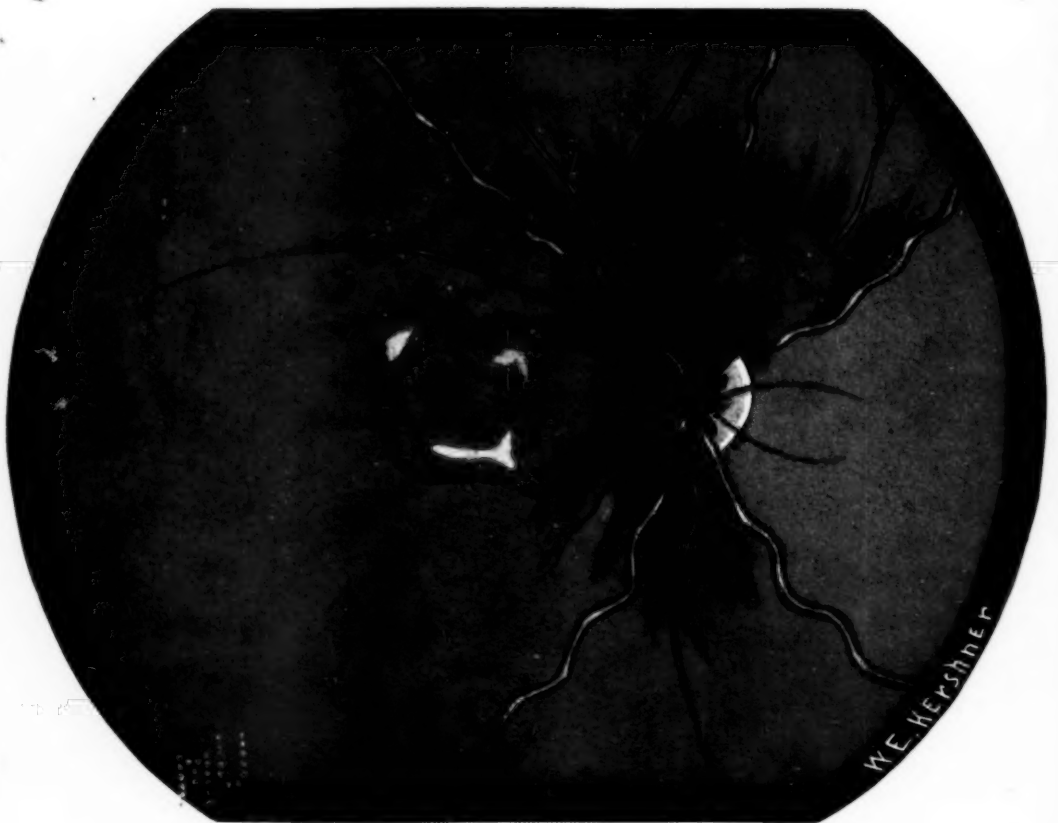
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INTRAOCULAR HEMORRHAGE IN BRIGHT'S DISEASE.
KERSHNER'S CASE.

AMERICAN JOURNAL OF OPHTHALMOLOGY

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No. 3

OCULAR INTERNAL HEMORRHAGE IN A CASE OF BRIGHT'S DISEASE.

MAJOR W. E. KERSHNER, M. C., U. S. A.

BATH, MAINE.

This unique case history includes an ophthalmoscopic study of the pathology of certain well known lesions of the eye ground, here associated in an unusual manner, and clearing up with remarkable rapidity and completeness.

The case presented here is considered of sufficient interest to report for the following reasons: First—the changes are markedly different in the two eyes, the right showing a decided optic neuritis of the third degree, or to be more exact a neuroretinitis; the left demonstrating beautifully three types of retinal hemorrhage without neuritis. Second—the above changes occur in a young man who had no increase in blood pressure, no arteriosclerosis, and no increase in the white cell count. Third—elimination was at all tests proven normal or sufficient. The phenolphthalein test was used several times; albumin was present in the urine, and also casts, which were persistent. Fourth—the cause of extensive retinal hemorrhage, of whatever type, and neuroretinitis indicates in this case a common exciting and predisposing factor. Fifth—the sudden resolution with the simultaneous clearing up of the pathologic changes in both eyes points to a definite relation between the two conditions.

It is indeed interesting to watch the rapidly changing conditions in the left eye as they progressed, and as they retrogressed.

CASE.

The subject of this report came to the outpatient Eye Clinic of one of the Base Hospitals in the United States, on February 18th, 1918. At this time

he complained that he could not see as well as usual, and that he had discomfort in his eyes. The patient was a tall, slim American of the brunette type, moderately well nourished, twenty-eight years of age; and above the average of his class and type in intelligence and strength of mind, as his personal history will show.

Family and Personal History.—Two brothers died of typhoid fever, one of diphtheria, and another in infancy. A sister died in infancy, another during labor. His wife died of puerperal eclampsia. This man is a mechanic in civil life, and works in cotton mills; the duties of his job are repairing looms. He denies absolutely any alcoholic indulgence for the past seven years; during the preceding four years, however, he drank heavily and constantly; he was intoxicated two or three times each week, and often drank 250 ccs. of whiskey before breakfast during these four years.

Previous Medical History.—Our patient had a series of attacks of objective vertigo about eight years ago, which improved after the discontinuance of cigarette smoking, to which he had been addicted for some years. Very slight manifestations of this complaint have visited him from time to time since the original attack, but have been controlled by diet and attention to his bowels. About six years ago he had

nocturia for a short period; this occurred once or twice each night. Measles and mumps fifteen years ago. Denies gonorrhoea and syphilis; also malaria, scarlet fever, smallpox, rheumatism and typhoid. There is no history of edema of the extremities at any time of his life.

The present condition dates only to February 14th, 1918, previous to which he had never had attention directed to his eyes. On this date the patient experienced a toothache-like pain in both eyeballs; the pain lasted longer in the left, and became quite severe. The vision began to fail in both eyes, and as he expressed it, "There is a cloud over my eyes all the time." He, at the time, had slight dyspnea, after sharp drills, slight headaches, but slept well and relished his food. There were no gastric symptoms, no cough, nor night sweats. There was a slight increase in the post-nasal discharge.

Ocular Examination.—Inspection negative, conjunctiva normal, ocular excursions satisfactory in all directions, pupils 2 to 3 mm., react to light, accommodation and convergence promptly; anterior ocular segments of both eyes normal.

Ophthalmoscopic Examination.—Right. Media clear; periphery of the fundus was congested with large tortuous veins; the arteries appeared full but not tortuous. The macula was heavily stippled and injected, as was the whole fundus; disc margins obscured, physiologic cup filled with exudate; perivascular lymph vessels full and bulging. The refraction of the nerve head was plus 1.5 D. We found here a clear picture of optic neuritis of the third stage, with a very few minute hemorrhages along the vessels.

Left. Media clear. Periphery of the fundus normal, except for the heavy tortuous veins; macula dark in color and heavily stippled. The nerve head was partly filled with blood to the nasal side above and below; there was no blood to the temporal side, nor was there bulging of the nerve head; no full perivascular lymph vessels. Extending from the disc, and appearing to come from in the disc, and reaching to

the nasal side, was a roll-like hemorrhage, somewhat clubshaped, enlarging as it went from the disc, which formed an abrupt rounded end, $2\frac{1}{2}$ disc diameters from the disc. The nasal end showed three distinct major rolls or folds, and several smaller ones; the rolls extended into the eye 1 mm., $1\frac{1}{2}$ mm., and 2 mm., respectively. The color of this mass was uniformly deeper than the fundus, except for three irregular grayish white areas where the folds merged into one another. The whole fundus was only slightly, if at all, congested, altho the veins were large and tortuous.

The vision at this time was: Right = 10/200. Left = 20/40.

The examination the following day showed no change in the right eye except a slight increase in the number of small paravessel hemorrhages. In the left eye we found all that was seen on the previous day, with an additional hemorrhage of the subhyaloid type, extending from the disc up, one disc diameter. This mass was elongated, being $2\frac{1}{2}$ disc diameters in the horizontal meridian. It covered the superior retinal vessel, and presented a sharply defined superior border and ends, but the inferior border seemed to blend with the hemorrhage in the disc, or to be attached thereto. This new hemorrhage was heavier in color and more coarsely stippled than the first one. The vision remained the same in each eye.

At the visit on February 21st, the right eye was found to be as already described, with the addition of more edema of the macula, and the development of the typical stellate exudate about the macula. The left again showed additional changes; there were present well defined flame shaped hemorrhages down from the disc between the inferior temporal and nasal veins which all but obscured the arteries. This extended downward nearly one disc diameter. There were also the same type of changes above and at irregular intervals all around the subhyaloid mass. The base of these new areas seemed to come from beneath the margin of the second hemorrhage, both above and to the nasal and temporal

ends as well. Smaller flames were present above and below the original roll-shaped mass. These last additions to our study increased in extent and density somewhat for two or three days, by which time an illdefined stellate grayish exudate appeared surrounding the macula which was more pronounced above than below. The vision, now under homatropin was: Right = 1/200. Left = 20/200.

The writer does not wish to convey the impression that the original hemorrhage in the left eye has been absolutely as seen the first day. While in the main it has remained so, yet from day to day the width of some of the rolls has changed slightly and the position of this mass varied somewhat; that is, higher and lower on different days. The accompanying illustration indicates the process when fully developed. See Plate V.

This condition of affairs lasted seven days with little or no change in either eye. On the morning of the eighth day there was no change in the right eye, but in the left all efforts to outline the fundus except in the extreme periphery were futile. A grayish haze, indefinite and indistinct, was all that could be seen of the disc. The fundus reflex was very pale; the central portion of the fundus was even less distinct than looking at an object thru a dense fog; only a suggestion of the fundus reflex could be obtained. This, mind you, was March 3rd, 1918, at which time the vision was: Right = 3/200. Left, hand movement at 1/2 M.

The following morning, much to our surprise, the neuritis of the right eye was decidedly improved; in the left eye the fundus was visible, with an absolutely normal disc, with an entire absence of all hemorrhages except the subhyaloid above the disc. The only indication remaining of trouble in this eye was a slightly hazy deepening of color at the site of the original hemorrhage. The tortuous veins in both eyes were gone. Vision: Right = 20/200. Left = 20/30.

An additional twenty-four hours presented us with normal fundi and with normal vessels; except for the subhyaloid mass, in the left eye,

which was little if any more than half its original size. The stippling was coarser in this area and grayish white spots appeared over the surface, which had a tendency to coalesce. As indicated above, the right fundus was now normal, except for a slightly striated fullness of the disc.

By the end of the third week the right eye presented a clear disc; normal fundus and vessels. In the left, continued contraction in the subhyaloid mass. Vision was now: Right = 20/30 plus 1. Left = 20/30 minus 1.

On March 18th, just one month after coming to the clinic, the vision was: Right = 20/20 minus 1. Left = 20/20 minus 2; with normal right fundus, and the left normal but for the hemorrhage, which now was about one-half its former size.

The form fields showed nothing unusual and coincided with like fields in any case of optic neuritis, namely, decided contractions for form and colors. In the left eye the form fields were not contracted to any marked extent, but there were absolute scotomata corresponding to the fringes or ends of the flame-shaped area. With the sudden resolution or release of neuritis in the right eye there was not a correspondingly rapid widening of the form field. The first day of the decided change for the better, the fields were practically not altered; the following day about five degrees widening manifested itself, and then proceeded a slow but steady increase in the width until it was about 10 to 12 degrees under normal, when the patient was lost to us.

The physical examination by the medical service is as follows: "The patient is a fairly well nourished and well muscled individual, with no deformities. Station and gait are normal, tendon reflexes are equal and normally active. Hearing to rough test is normal; the tongue is moist, clean, tooth-marked, and coarsely tremulous. The tonsils are well atrophied and very slightly cryptic. The superficial glands are not palpable, the thyroid is slightly palpable and visible. The peripheral vessels are palpable, but do not pulsate. The chest is asymmetrical, on the

nipple level; the left side measuring $17\frac{3}{4}$ inches, the right side 16 inches. Expansion is shallow, but apparently equal. The lungs are resonant to normal limits, and expand at the bases. The breath sounds are vesicular; there are no rales."

"The cardiac impulse is neither visible nor palpable. The left border of the heart is 9 cm. from the midsternal line, and the right 2 cm. The cardiac rhythm is normal, 96 to the minute while standing. There is a mild sinus arrhythmia; at the apex there is a short, untransmitted, systolic murmur with a well accentuated second sound. At the aortic cartilage the sounds are somewhat distant with a slight ring of the second sound. At the pulmonary cartilage the first sound is lost, but the second is clear. At all areas the sounds are somewhat distant. The systolic blood pressure is 124 mm. mercury; the diastolic 90 mm. In a recumbent position the cardiac rate is 72 per minute. After an effort test there is a perfect recovery in two minutes."

"No tenderness or rigidity in the abdomen is found. The liver is just palpable on deep inspiration. The kidneys and spleen are not palpable; the skin reflexes are active."

The laboratory findings were as follows: "No leucocytosis, no malaria, no hookworm, and negative Wassermann."

Examination of the urine, 24 hour specimens showed it always acid and free from sugar.

Date	Amount	Albumin	Microscopic
2/18	2200 cc.	Present	Red blood cells, hyalin and granular casts.
2/21	2200 cc.	Present	Granular casts.
2/25	2200 cc.	Trace	Granular casts.
2/27	1800 cc.	Absent	Few granular casts.
3/10	1700 cc.	Absent	Few granular casts.

There are manifestly conditions here which are of interest. These are a close relation between neuritis and ocular hemorrhages in kidney disease, or an anatomic factor in this left eye which manifested itself by an optic neuritis in the right; and hemorrhages, multiple and massive, in the left.

THE TREATMENT OF TRACHOMA AND CHRONIC CONJUNCTIVITIS WITH NEGATIVE PRESSURE.

B. M. HOWLEY, M. D.

NEW BRUNSWICK, N. J.

This is the account of a practical method of treating trachoma less painful and less formidable than rolling the lids or grattage, but apparently capable of achieving similar results.

It is now three years since I began this treatment and my results have been so satisfactory that I feel that I am justified in reporting them. In the earlier stages of trachoma, when squeezing is the favorite method of treatment, this still ranks high in my estimation as the best method. But negative pressure at the time of operation or later can be of great service. It is to those cases of trachoma which are not operative cases, but which are so chronic in character, that they are almost incurable, that I wish to direct attention.

The most favorite method of treatment has been blue stone, and I must

say that I think it is one of the most barbaric treatments that could be devised. The pathologists state that in trachoma there is a round cell infiltration with the formation of scar tissue, and at the same time they speak of an infection that has not been positively identified. Now, I will not enter into the pathologic or bacteriologic aspect of the disease, but I would like to draw attention to the fact that negative pressure is the most positive way of abstracting the secretion and infection from the conjunctiva of the lid.

Blue stone acts by its irritating qualities and abstracts water from the tissues. Negative pressure draws the se-

cretion and the infection from the glands and causes resolution to a certain extent in the affected lid. The amount of negative pressure that the patient will allow will vary, but I have had a negative pressure of ten pounds on the upper lid and five or six pounds on the lower lid. This is not a steady pressure, as you will be guided by the sensitiveness of your patient as you sweep your applicator across the lid ready to lessen the vacuum if it becomes painful. The junction of the upper lid with the culdesac, and the culdesac, are more sensitive to negative pressure, but with perseverance you will accomplish a great deal. The lower lid, altho sensitive, will stand

shows the entrance of secretion and the sensitiveness of your patient. If it is a case for scarification or scraping you will cocaine and then after scraping or scarification you will apply the negative pressure. Scraping with the aid of a small scalpel I think is one of the best ways of attacking the fine granular type of trachoma. In sensitive patients you may apply a four per cent solution of cocaine to the lids, but the average person will let you treat them without it.

The conjunctiva of the upper and lower lids, also the culdesac, is cleansed with a solution of boric acid or bichlorid of mercury 1—10,000. After everting the upper lid I place the ap-

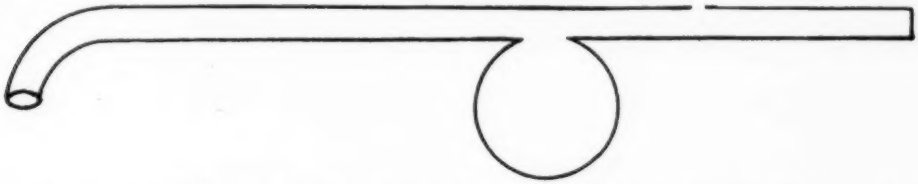


Fig. 1. Glass tube applicator of Howley. Curved tip to be applied to the conjunctiva; globe to receive secretion below, and opening in tube above by which vacuum can be controlled with tip of finger.

three or four pounds of negative pressure if you use the sweeping motions as I have advised in the upper lid. Be careful and do not pull the applicator from the tissues as it is painful and may tear the tissues. As a rule the average patient will bear six or seven pounds on the upper lid and three or four pounds on the lower lid without complaining.

At the beginning of this treatment I had a gauge which showed the amount of negative pressure, but later discarded it as I found it cumbersome and not of practical utility. The glass tubes used by me have been made by the Sorensen Pump Company, of New York, whose pump I use in my work, altho any good pump will do. They are modelled after tubes that have been made and used in nose and throat work. It is not necessary to have a vacuum gauge, as with your finger resting on the opening of the applicator you can regulate the amount of negative pressure according as your tube

plicator on the lid and with a sweeping motion run the applicator over the conjunctival surface from the inner to the outer canthus or vice versa. Many sweeping applications can be made to the lid in this way until the tube shows secretion with some blood, if the surface is irregular or granular, and you may be amazed at the amount of secretion that comes from the lids.

The glass attachments are 120 mm. in length with a curved end 4x3 mm. that is applied to the tissues. There is a central bulb or chamber to hold the secretions that are drawn off, and 5 mm. back of the bulb is a small opening in the tube for the finger of the manipulator to make or break a vacuum as he desires.

If the trachoma is slow to yield I scarify and then use suction. Previous to scarification I wash the lids, especially the culdesac, with a solution of boric acid, and wipe with a solution of bichlorid of mercury 1-5,000. Cocain having been applied, I use a small scal-

pel or scarifier and scarify freely, wiping the blood away. I then apply negative pressure and remove the blood and infective material.

The patients who have thickened lids, and a conjunctiva of a rough, granular type, you cannot only scarify, but you can scrape with a small scalpel and then apply the suction tube. These patients, as in all cases that I have treated by this method, will invariably tell you that the eye feels better with the first treatment. In trachoma or in chronic conjunctivitis especially when it is monocular, it is always advisable to see that there is no stenosis in the nasal duct.

My results have been obtained in private practice and therefore, I have not a great number to report. I have had about twenty-five cases of trachoma, and they have varied from the mild cases to the most aggravated or severe ones. The mild cases yielded to negative pressure and if slow, a moderate scarification followed by suction yielded quick results. In these cases negative pressure is applied two or three times a week, followed by an application of bichlorid of mercury 1-5000, or argyrol 20 per cent. Scarification could be performed every two or three weeks as indicated by the progress of the case or the severity of the disease. Silver nitrat 1 per cent or 2 per cent is of great benefit in these cases. For home treatment I order hydrargyi bichlorid 1-10,000, argyrol 20 per cent, or zinc sulphat gr. 1 to 1 oz. Persistent treatment along these lines will cure some cases in three months.

The severe cases that have been pro-

gressing for years are not so amenable to treatment, owing to the marked infiltration in tissues and the formation of new connective tissues and its resulting deformity. In these cases I always begin as soon as possible with a scarification, which I make as thoro as possible, and then apply suction to the bleeding tissues. My results have been good and very satisfactory, but not as satisfactory as in the milder cases. This is due to the pathologic changes and formation of new tissue. The results have been better than from any method I know of, excepting certain cases where tarsal removal may be performed. It seems to me that the early application of negative pressure, with scarification in these thickened lids, will make tarsal removal unnecessary.

In your old trachoma cases you will clear up an infective discharge, make the eye feel much better and reduce your infiltration to a great extent, but you cannot remove connective tissue by this method.

Chronic conjunctivitis that resists treatment by the ordinary methods will speedily yield to negative pressure with local applications. Vaccines have been made from the infection obtained from the conjunctiva with negative results. Whatever is the primary cause of trachoma—the latter stages show a mixed infection.

In conclusion I wish to say that in trachoma there is no remedy in my hands that has been as beneficial as negative pressure, as it removes the infection and causes absorption to take place in the infiltrated tissue.

DETACHING OF BULBAR CONJUNCTIVA AS A TREATMENT OF TRACHOMATOUS PANNUS.

KAZUO HIWATARI, M. D.

KYOTO, JAPAN.

This method evolved from modifications of tarsectomy has something in common with the old operation of peritomy for pannus, and yields very favorable results as here reported.

There are various kinds of treatment of trachomatous pannus, among which friction with certain medicaments, cauterisation, peritomy with some modifications (Agnew's operation or Denig's transplantation, for instance), and tarsectomy are to be mentioned.

The indication for each of them must be determined, in every given case, with regard to the circumstances of the pannus itself on the one hand, and to the trachomatous changes of the lids on the other hand.

In a chronic trachoma case with a heavy hypertrophy of the tarsus, accompanied by pannus, the tarsectomy after Heisrath-Kuhnt gives usually, but not always, a good result for the pannus.

Modifications after Murakami or Mizuo of the Kuhnt's tarsectomy, which differ so far from the original method that bulbar conjunctiva is detached more widely than the latter, are also to be recommended for such cases. The reason why trachomatous pannus is so favorably influenced by the tarsectomy is an interesting problem for which many factors can be enumerated.

Above all, the absence of hypertrophied tarsus and of affected conjunctiva, which might have mechanically, or otherwise, an injurious effect upon the cornea, seems certainly to be one of them. But this factor must not be thought too much of, for the trachomatous pannus is not always parallel with the existence of hypertrophy of the tarsus or the intensity of trachomatous changes of the conjunctiva. It may be missed even in severe cases with hypertrophied tarsus; while, on the con-

trary, it may be met with sometimes in slight forms.

In recent years I obtained the most favorable results in the treatment of trachomatous pannus with hypertrophy of tarsus, by the modification after Mizuo of the Kuhnt's tarsectomy, in which the detaching of bulbar conjunctiva is carried out more widely than in the original method. Consequently it occurred to me that the most important factor which may exert a good influence upon the tarsectomized case of trachomatous pannus might be probably the detaching of the bulbar conjunctiva, performed during the course of operation.

From that point of view I tried in the following years the detaching of bulbar conjunctiva only as a treatment of trachomatous pannus, with or without hypertrophy of the tarsus, and especially in the former cases when the tarsectomy was out of question owing to diminution of the fornix, or when the pannus was clinically the essential disturbance, the conjunctiva having been almost restored from the trachomatous changes. The results were so excellent that I was pressed to describe my own method shortly in the following lines.

After disinfection of the eyelids and the conjunctiva, under general precautions 0.5 or 1.0 ccm. of 1 per cent cocaine solution is injected subconjunctivally upon the fornix or upon the bulbar conjunctiva close to the latter. By this, insensitiveness and looseness of the conjunctiva may be achieved.

Then a flat incision is made by means of a thin and sharp knife parallel with the upper margin of the tarsus from the

inner to the outer canthus, thru the fornix or the bulbar conjunctiva.

Three suture threads are introduced thru the lower lip of the conjunctival wound, in the form of loops; and given to an assistant, who helps further the detaching of bulbar conjunctiva from the underlying tissue, by moderate traction of them.

The detaching of conjunctiva bulbi towards the cornea is achieved usually very easily with less bleeding by the help of Graefe's linear knife. Upon the limbus only, where the conjunctiva is intimately adherent to the subjacent corneal tissue, it needs a little more powerful procedure.

The detaching must be extended also towards median and lateral sides of the cornea, if the blood vessels run into the pannus from those sides.

The incision wound of the conjunctiva is sutured continuously towards inner and outer canthi by means of the middle loop. Fixation of each end of the suture thread on the skin of inner and outer canthus is made with adhesive plaster, and a bandage.

As after-treatment daily washing of the culdesac with a weak disinfecting solution is recommended, and if a strong irritation is caused, instillation of atropin is naturally required. Removal of the suture is done after four days.

If necessary, mechanical or medicinal measures must be further continued against the trachomatous changes upon the conjunctiva and fornix, after complete healing of the wounds.

I have twenty cases of trachomatous pannus in 13 patients thus operated, which have been observed long enough to determine the effect of my operation.

The blood vessels in pannus diminished gradually in all cases after this operation, and in the cases where one or one-half year has already elapsed they can be no more found even by means of a loupe. More or less corneal opacity in irregular form remains as

residuum of the pannus.

Altho I am agreed with Prof. Onishi that there are some cases of trachomatous pannus, if few, where remissions spontaneously occur, I never saw a full disappearance of the blood vessels from the pannus in such cases. So the complete disappearance of the blood vessels in my operated cases must be ascribed to the favorable effect of the operation. No recurrence has been observed in any of my cases.

Recovery of the visual acuity after operation was as follows:

Visual acuity	
before operation	After one year
0.5	1.0 in 6 cases
0.3	0.7 in 5 cases
0.7	1.0 in 2 cases
Hand movement 1 m.	0.3 in 3 cases
After one and a half years	
0.5	0.9 in 2 cases
0.2	0.5 in 2 cases

Altho the cases are not very numerous, the result of my operation is to be mentioned as satisfactory; and I can conclude with safety, from my own experiences, that my method is not inferior, at least, to tarsectomy.

The favorable effect of my operation upon the trachomatous pannus is now recognized by other ophthalmologists of our country. Nagano has recently reported on his 21 cases of trachomatous pannus, which he had treated after my method with good results.

In the ophthalmologic clinic of the imperial university of Kyoto the detaching of bulbar conjunctiva is now recommended in the treatment of trachomatous pannus.

I suppose further that the detaching of the bulbar conjunctiva may be applied perhaps also as prophylaxis in cases where invasion of pannus can be expected; by destroying pathologic tissue already existing in and around the limbus; or, if not yet affected, by producing cicatricial tissue in the subconjunctiva, which prevents further advance of the trachomatous infiltration towards cornea.

REFERENCES.

1. Heisrath, Ueber die Behandlung der granulösen Augenentzündung, etc. Leipzig, 1904.
2. Kuhnt, Therapie des Trachoms. Jena, 1897.
3. Murakami, On tarsectomy as a treatment of trachoma. Report of the Medical Society of Kyushu, Japan. Vol. XII.
4. Mizuo, Japanese Encyclopedia of Therapeutics. Vol. X. Published by Nisshin-Igaku-Sha, Tokio, 1910.
5. Onishi, A lecture on trachoma. Report of the Japanese Ophthalmological Society. Vol. XVI, p. 607.
6. Denig, Transplantation bei chronischen trachomatösen Pannus. Zeitschr. f. Augenheilkunde, Bd. XXV. S. 278. 1911.
7. Hiwatari, Detaching of bulbar conjunctiva as treatment of trachomatous pannus. A paper read at the meeting of the Kinki Ophthalmological Society, Nov., 1917.
8. Nagano, On the detaching of bulbar conjunctiva after Hiwatari as a treatment of trachomatous pannus. A paper read at the meeting of the Kinki Ophthalmological Society, July, 1918.

DIFFRACTION IN THE HUMAN EYE AND THE PHENOMENA OF COLORED RINGS SURROUNDING LUMINOUS SOURCES.

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This paper from the Department of Applied Optics in the Ohio State University explains certain entoptic appearances; likely to be observed by the patient who may inquire with regard to their occurrence and significance.

Quite recently we have read a paper by Dr. R. Brudenell Carter,¹ of England, on "The Appearance of Color Spectra to the Aged." He describes in some detail the phenomena seen when looking steadily "at an ordinary electric filament light, about ten feet distant from the eyes." The light then appears to be surrounded by a vivid color circle of about two feet diameter, with the red border external, the blue internal, while the yellow and green are intermediate. "This band appears to be about six inches in width, so as to be clear of the light itself, from which its inner margin appears to be about six inches distant." If a lighted match is held at arm's length "the color circle around the flame appears to be about as large as a florin, while that around the full moon is very large and of very brilliant colors."

Dr. Carter concludes that the optical (refractive) condition of his eyes has nothing to do with the phenomena. He says, however, that if a strong light is brought sufficiently near his eyes the color circle disappears, but comes into existence again as the pupils expand when the light is carried away from the eyes. The color circles are also obliterated when looking thru a pin-hole opening. He concludes that the cause

of the color phenomena is "*the diminishing refractive power of some of the ocular media.*" After ruling out the vitreous humor, "atmospheric, secretory or compressive changes" the conclusion is reached that "the crystalline lenses are themselves the immediate causes of the phenomenon," and that these phenomena do not indicate diminution of or loss of lenticular transparency. In conclusion, Carter regards the color rings merely as an "*accidental result of unimportant lenticular conditions.*" Since this paper was written, an excellent résumé of recent comments on this topic is given by Major Chance² in the "Digest of Ophthalmic Literature."

The writer of this paper has been interested in these subjective phenomena of color rings surrounding luminous sources for some time, and has carried out some experimentation thereon. He has also included in his work on "Physiological Optics"³ some of the essential facts which various authorities have been able to discover relative to the phenomena under discussion.

With such of Dr. Carter's statements as relate to the appearance, order of colors and so forth, we are in accord. However, we cannot agree with those statements which attribute the color

phenomena to diminished refracting power of some of the ocular media (presumably the crystalline lens according to Dr. Carter); nor again to the final conclusion that these rings are mainly the accidental results of unimportant lenticular conditions; for we shall present evidence to show that they are due to the superficial cells of the epithelium of the cornea or to the endothelium of the Descemet's membrane.

COLORED RINGS MAY NOT BE SEEN BY ALL OBSERVERS.

Likewise, the title of Dr. Carter's article—"The Appearance of Color Spectra to the Aged"—is, in our judgment, a misnomer; since age has, in and of itself, nothing to do with the phenomena, as we hope to show in succeeding paragraphs. These colored rings are not commonly observed because, as a general rule, the light source makes the surroundings too luminous. Or, in other words, there is not sufficient contrast between the light and its environment, such as is obtainable, for example, by striking a match in an otherwise darkened room. And for the further reason that these phenomena are not observed to exist, just as is true in the case of physiologic diplopia, unless the attention of the observer is directed to them. Furthermore, from the explanations which follow, it will be found that the intensity of illumination of the rings is only about two one-hundredths of that of the corresponding intensity of the first maximum (i. e., the original light source), hence, these rings falling upon portions of the retina external to the macula and having low intensity may not be visible in some cases and will not be observed in many others unless first described and then looked for.

The writer has observed these colored rings under favorable conditions for over ten years; and being still under forty years of age, these effects cannot be attributed, in his case at least, to the effects of age *per se* upon the crystalline lens, or other portions of the ocular mechanism. During this period of time his refractive correction

has changed from +1.25 D. S. $\left(\begin{smallmatrix} - \\ +0.50 \text{ cyl. ax } 90^\circ \end{smallmatrix} \right)$ to +4.25 D. S. $\left(\begin{smallmatrix} - \\ +0.50 \text{ cyl. ax. } 90^\circ \end{smallmatrix} \right)$.

The attention of many students coming under the instruction of the writer, and of others coming under his observation, has been directed to these phenomena of colored rings; and with but few exceptions they have been readily observed. This has been true irrespective of the refractive condition, whether myopic, hyperopic or astigmatic, and irrespective of whether or not correcting lenses were worn. Hyperopic conditions apparently tend to make the phenomena (with respect to ring No. 1; see later discussion), more readily seen, however. This we believe to be due to the concentration of light, or sharpness of retinal image obtained by virtue of the small pupils, generally accompanying hyperopia; and the nature of the distribution of light upon the retina as affected conjointly by the condition of refraction and chromatic aberration. The size of the pupil, unless extremely and abnormally small, has no effect upon the phenomena. By this we mean that the phenomena are observable alike to those with large or small pupils.

They are also readily observed with ciliary and sphincter muscles relaxed, when viewing sources of light at large distances; or, again, when both are innervated, as in accommodating for such a source at close points. We are in agreement with Carter that these rings are not seen when the light is approached too closely, i. e., within a few inches of the face. The reasons are apparent: First, the contraction of the ring upon the approach of the source, and secondly, the submerging of the ring in the general central illumination surrounding the source. Also, these rings will not be seen when looking thru a small aperture, such as a narrow stenopaic slit. But the corona and striae radiating out from the light source will be found to be crossed at right angles by a series of parallel colored fringes, which arise from the diffraction effects observable thru any narrow slit. In this case the physical phenomena of interference and diffrac-

tion of light enter into the effects produced.

METHODS OF EXPERIMENTATION AND RESULTS.

One of the most serviceable and convenient sources of light to be used in observing the phenomena under discussion is the small lamp of a self-luminous retinoscope or ophthalmoscope. This light source is steady, small and brilliant when viewed in a darkened room.

If this, or a similar, luminous source is viewed at any convenient distance,

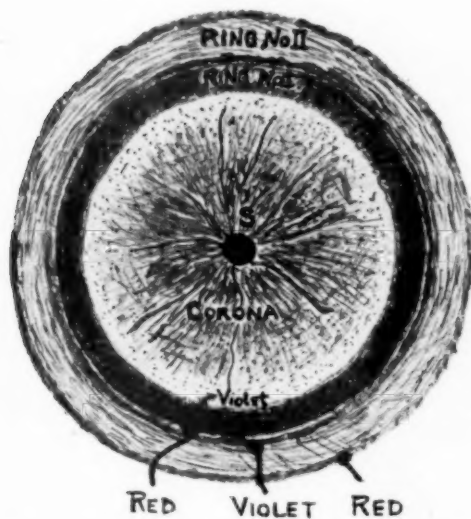


Fig. 1. Diagram illustrating relations of light source S, ciliary corona, and rings I and II.

the arrangement of colored rings and ciliary corona, so called, will be somewhat as roughly diagramed in Fig. 1.

The Ciliary Corona.—Surrounding the whole of the luminous source is a general luminous glow, with several prominent striae or rays shooting out in various directions from the central light. This phenomena is very striking if the light source is brilliant. The name of ciliary corona has been attached thereto. (Tscherning⁴.) This ciliary corona is composed of an infinity of very fine, and oftentimes many colored radiations, which cross thru the whole of the luminous area. Its extent depends upon the intensity of the

light source, or the luminous flux entering the observer's eye. Using an arc lamp, or the image of the sun reflected from a convex mirror, there will be found a diameter of the corona which may reach 8 degrees. An examination of these phenomena with monochromatic light causes some minor changes in their character. Under these conditions the corona presents the form of a luminous dust, crossed by few radial striae. Druault⁵ says that, under such conditions, there may be seen quite near the luminous area one or two fine black rings, due to diffraction by the border of the pupil. That portion of the luminous "dust" or haze close to the light source appears to have a constant motion of the nature of contractions and dilatations, which probably correspond to changes of the pupil (Druault). However, we suggest that, if the corona is produced by crystalline lens fibers, these fluctuations may be due to small variations in the action of the accommodative apparatus.

Ring No. I.—Surrounding the ciliary corona will be seen the vividly colored ring (marked No. 1 in Fig. 1), presenting the colors from blue to red from the center to the periphery of the ring. If the luminous source is not very bright this ring forms the limit of the corona, but if its intensity is high the diameter of the corona may attain a value double that of the ring. Furthermore, these phenomena appear to be universal. Nearly anyone walking along a street lighted by gas or electric lights may observe them.

Ring No. II.—In addition, under conditions to be further discussed, there may be seen a second ring (marked Ring No. II in Fig. 1); somewhat fainter than ring No. I and closely bounding it, with colors arranged in a similar order. The writer has observed both of these rings simultaneously on a few occasions, when the light source was rather powerful and the pupil in a sufficiently dilated condition. The artificial dilatation of the pupil by cocaine makes more probable the appearance of this second ring; but in addition it is generally necessary that the light source be brilliant, small and close at

hand. Otherwise the intensity of illumination of the ring by virtue of its size and the position and character of the retinal illumination are too low to make it visible. Upon the basis on which we shall attempt to explain these phenomena, namely *diffraction of light*, it will be shown that the intensity of this second maximum is only about one-third of that of the first maximum (i. e., the first ring), or about one two-hundredth of that of the original

data relative to our own eyes, since we are certain of fair accuracy in this case at least. The determinations of the diameters of the various portions of the colored ring No. 1 were made by the use of the small ophthalmoscopic lamp, held at distance of distinct vision, and observing (or marking) as nearly as possible the points cut by the various colors as seen upon a celluloid millimeter rule mounted just back of the lamp. No great accuracy in these

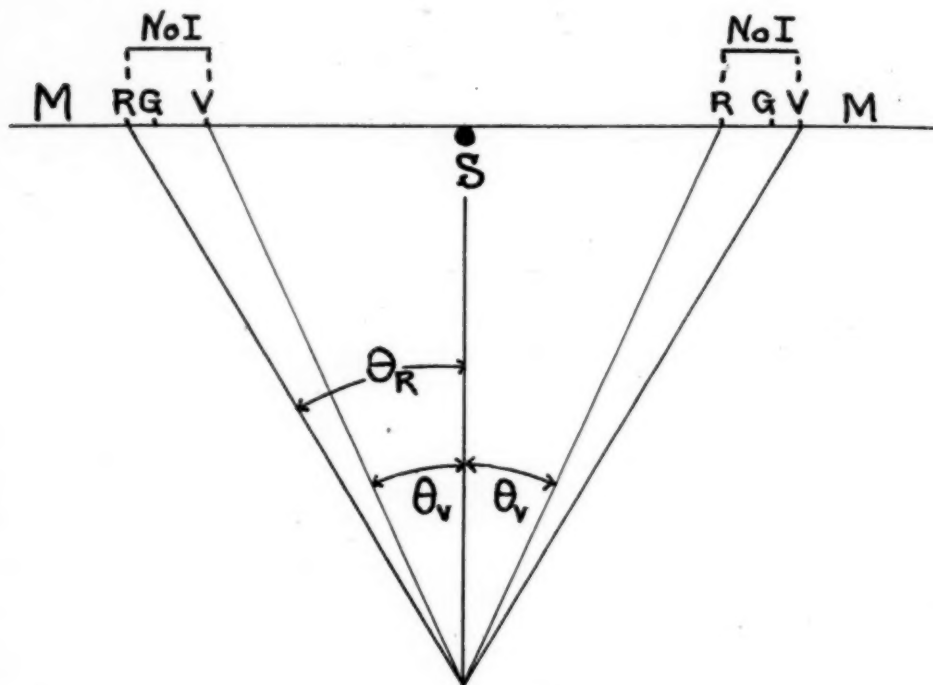


Fig. 2. Diagram illustrating the relation of the angles which determine the rings of the various colors, and their distance from the source of light. See text.

source. We have also to consider the fact that the situation of the retinal image is more peripheral in the case of the second ring, hence making its mental reception and interpretation less likely. The presence of a large pupil would, therefore, be conducive to greater flux of light and hence greater intensity of retinal stimulation.

DATA ON DIAMETERS OF THE RINGS.

We have made several sets of observations and obtained data given by several subjects, but prefer to tabulate the

measurements can be claimed, i. e., within ten per cent probably, and yet the results were very concordant. Knowing, therefore, the diameters of the portions of the colored rings and the distance of observation, the angle, (θ), subtended at the nodal point of the eye by each of the colors could be found by calculation. The method is graphically illustrated in Fig. 2, in which S represents the source of light, $M M$ the millimeter scale, $V V$, $G G$ and $R R$ the diameters of various portions of ring No. I. The data for ring No. II

were obtained in a similar manner altho with less likelihood of accuracy.

A résumé of the experimental data is as follows:

TABLE I.
Angle (θ).

Ring	Red $\lambda=6500$	Green-Blue $\lambda=5000$	Violet $\lambda=4000$
I	3° 40'	2° 40'	2°
II	8°	5° 40'	4° 20'

THEORY OF THE DIFFRACTION OF LIGHT
BY CIRCULAR APERTURES AND CIR-
CULAR OPAQUE DISCS.

It is not our purpose in this paper to recopy the details of various mathematic proofs relative to the relations between slit width or space between particles, angle of diffraction θ and wave-length λ ; but rather to take the final formulæ calculated in treatises on physical optics and apply them, with some explanations, to the subject under discussion. We shall also point out how the phenomena of interference of light enter into this problem. It is to be hoped that some digression will be pardoned in the interest of those who are not as familiar with the phenomena of diffraction and interference of light, as are physicists and those who are specialists in pure optics.

When light, diverging from a luminous point, passes by the edges of an opaque obstacle, systems of colored fringes are formed parallel to the edges of the shadows. Or if, for example, a knife-edge slit is cut in a piece of cardboard and a luminous source viewed thru the slit, there will be observed a series of parallel colored fringes, separated by dark strips, if a white light source is used. If a monochromatic source is used, then the fringes will be of one color and parallel to the lengthwise dimension of the slit. In the case of a circular disc or circular aperture, the fringes form a system of concentric circular rings. If we have a large number of irregularly distributed small equal apertures in an opaque screen it can be shown mathematically and experimentally that the diffraction pattern is the same as that produced by a single disc or aperture multiplied, in

intensity, by the number of apertures (or discs).

By the principle of Babinet as applied to diffraction screens which are complementary, by which we mean a pair of screens in which the transparent portions of one are replaced by opaque portions in the other and *vice versa*,—it is found that the diffraction patterns are the same in the two cases. Hence circular discs or apertures are interchangeable in our theories.

Fraunhofer found that these colored rings could be produced artificially by looking at a source of light thru a plate of glass covered with fine particles of condensed vapor or with lycopodium dust. The condition necessarily imposed is that the globules shall be of sensibly uniform size. He also obtained these rings with a large number of small metallic discs of equal size, placed between two plates of glass; and found that the diameters of the rings varied directly as the wave length and inversely as the diameters of the discs. Further classical experiments by Verdet, Young and others give modified proofs supporting such conclusions. Hence we may conclude that any system of regularly spaced slits or obstacles, apertures or discs will give diffraction effects. Furthermore, in the case of diffraction by a large number of irregularly arranged circular apertures or discs, the phases between the parallel disturbances from homologous points vary in an irregular manner, and we have as much reinforcement as destructive interference in any given direction. The illumination at any point is the same as that produced by a single aperture multiplied by the number of apertures.

We have used the terms phase, interference and reinforcement in the foregoing sentences. Two particles, for example, are said to be in the same phase of motion when their displacements and directions of motion are the same; and two particles in the same phase are separated by a complete wave length, or by any whole number of wave lengths. Light of a certain wave length will be reinforced by light

of a similar wave length if they are in phase. If in opposite phase—that is, if one is executing a motion diametrically opposed to the other—they will interfere with or tend to annul each other. As a simple illustration of interference and diffraction, assume two narrow slits, A and B , as shown in Fig. 3, behind which is placed a source of light O , and consider the illumination at various points on the screen MN . Take the point Q directly opposite the middle of the slits; then light diffracted at A

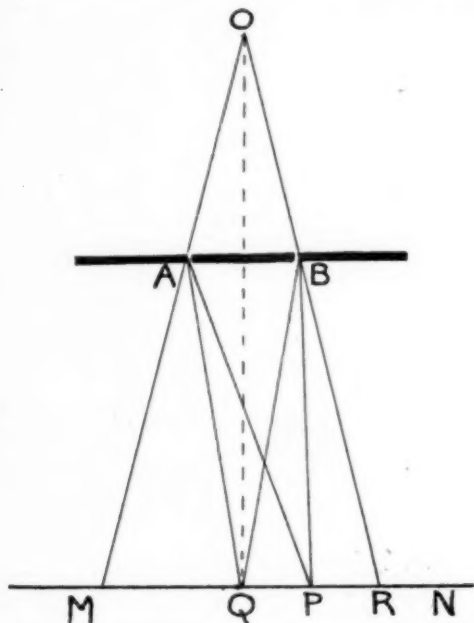


Fig. 3. Diagram illustrating formation of diffraction bands by two slits. See text.

(in such a direction as to reach the point Q , since light when diffracted by an aperture is not limited to one definite direction), and at B , meeting at Q , will be in phase, since the distances AQ and BQ are equal and contain an equal number of wave lengths or fractions thereof. Hence Q will be *luminous*. If we take the point P , for illustration, such that the difference between AP and BP is an odd number of half wave lengths (such as $\lambda/2$, $3\lambda/2$, etc.), then the wave motions reaching P will be in opposite phases and will interfere, producing darkness or a minimum of illumination. Again, if the point R is so situated that

the difference between AR and BR is any number of wave lengths (such as λ , 2λ , 3λ , etc.), there will then be a *luminous point* or *maximum* of illumination. Hence alternate bright and dark fringes are due to phenomena of diffraction and interference.

Let us now consider the case of diffraction of parallel beams of white light by a series of particles as diagrammed in Fig. 4. Let a , b , c , etc., represent the equal sized and equally spaced discs. The components of white light will then be diffracted or bent at the edges of the discs, the blue being diffracted the least and the red the most. The blue rays are represented by the longest lines, the yellow by the medium and the red by the shortest lines. The series of diffracted rays of each color will be mutually parallel.

Next consider the effect of a convex lens placed behind such a system of diffracting corpuscles. In cross-sectional diagram, then, each condition of focus of color with respect to the image, S_1 , of the center source S is as diagrammed in Figs. 5, 6 and 7, in which S_R , S_Y and S_B represent the images for red, yellow and blue respectively. The amount of diffraction (θ), or bending of light increases proportionately with the wave length of light used. Figs. 5, 6 and 7 represent the point images obtained for definite wave lengths of light in one plane only. Hence, to complete the true representation of effects as they would actually appear in space, we have only to conceive of such planes (cross-sections), taken at every conceivable angle or to mechanically rotate the Figs. 5, 6 and 7 about SS_1 as an axis to obtain a condition of affairs precisely the duplicate of Fig. 1, in which there is shown a central source (or image in space) S surrounded by colored rings of varying angular widths depending upon the wave length (color) taken. The necessary elements for these diffraction effects we believe can be shown to exist in the eye; for we shall show that corpuscles of the proper diameters exist in the cornea, while the crystalline lens plays the part of the lens presented in the physical considerations of the statements relative to Figs. 5, 6 and 7.

To return, then, to the mathematics of diffraction of light by circular apertures or discs, we find that theory (see Preston's "Theory of Light"⁶ and Wood's "Physical Optics"⁷) gives for the relation between the wave length λ , the angle of diffraction θ , the radius of the aperture or disc R , the order of the spectrum m (i. e., whether the first, second, etc., colored band), the equation

$$\sin \theta = \frac{m\lambda}{\pi R}$$

$$\text{or } m\lambda = \pi R \sin \theta.$$

This equation has the same form as that for diffraction due to parallel slits, such

known experimentally and m/π is obtainable from the above table, let us calculate the value of R , the radius of the disc or particle causing the phenomenon and see if there is any anatomic evidence of cells or structures of the eye fulfilling the conditions necessary for such diffraction effects. One or two specific examples are carried out somewhat in detail and the remainder tabulated as Table III.

Ring I. Blue-green. $\theta = 2^\circ 40'$. $\sin \theta = .0465$. $\lambda = 5,000 \times 10^{-8}$ cm. (approximate blue) $= 0.5 \mu$. $m/\pi = 1.333$. Hence from $R = m\lambda/\pi \sin \theta$, we find that $R = 0.0009$ cm. or $R = 9\mu$.

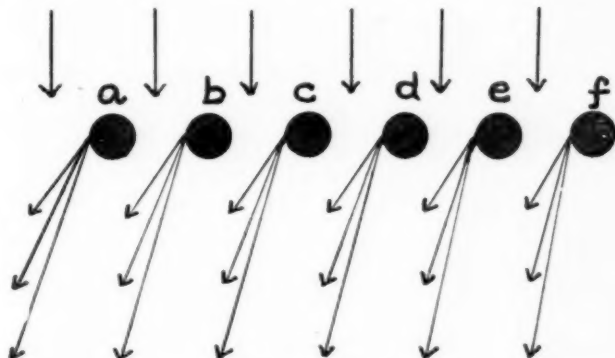


Fig. 4. Diagram of diffraction of light by a series of particles, separated by equal spaces. See page 190.

as is found in a plane diffraction grating, namely $m\lambda = d \sin \theta$. A comparison of the equations shows that d , the slit width, corresponds to πR , R being the radius of the aperture or disc.

Verdet⁸ calculated the subjoined table for values of m/π corresponding to the first few maxima and minima.

TABLE II.

	m/π	Intensity
1st Max.	0	1
1st Min.	0.61	0
2nd Max.	0.81	.0174
2nd Min.	1.116	0
3rd Max.	1.333	.0041
3rd Min.	1.619	0

APPLICATIONS OF DIFFRACTION THEORY TO THE PHENOMENA OF COLORED RINGS.

Since we have the evidence of diffraction rings produced by some medium of the eye, and since θ and γ are

Ring II. Blue-green. $\theta = 5^\circ 40'$. $\sin \theta = .098$. $\lambda = 5,000 \times 10^{-8}$ cm. (approximate blue) $= 0.5 \mu$. $m\pi = 1.333$. Hence, substituting in $R = m\lambda/\pi \sin \theta$, we have $R = 0.00066$ cm. or $R = 6.6\mu$.

It is to be remarked at this point that the sets of readings and hence calculations upon ring I are much more likely correct than in the case of Ring II, in which difficulties of low intensity (S) make the determination of the angles (θ) less certain.

If, therefore, we accept the experimental data and results as being reasonably accurate and the applications of the theory of diffraction by circular apertures or discs as being permissible in the case under discussion, we arrive at the conclusion from the calculations tabulated above that Ring II is not a second order effect of which Ring I is the first order effect, but that it is due to a set of

TABLE III.

Set	θ	$\lambda \times 10^{-8}$ cm.	m/π	$R = \frac{m\lambda}{\pi \sin \theta}$	D = diameter of particle	Ring
A	2°	4000	.82	10 μ	20 μ	I
A	2° 40'	5000	.82	9	18	I
A	3° 40'	6500	.82	8.5	17	I
				Av. = 9.2 μ	Av. = 18.4 μ	
B	4° 20'	4000	1.33	6.8 μ	13.6 μ	II
B	5° 40'	5000	1.33	6.7	13.4	II
B	8°	6500	1.33	6.4	12.8	II
				Av. = 6.6 μ	Av. = 13.2 μ	
C	4° 20'	4000	.82	4.4 μ	8.8 μ	II
C	5° 40'	5000	.82	4.1	8.2	II
C	8°	6500	.82	3.9	7.8	II
				Av. = 4.2 μ	Av. = 8.3 μ	

particles or apertures of much smaller diameter as shown in set C, Table III. We conclude, therefore, that the apertures or particles giving rise to Ring I have an average diameter of 0.00184 cm. or 18.4 μ and, in turn, those producing Ring II an average diameter of 8.3 μ , unless this ring is due to second order diffraction effects of the same corpuscles, when calculation gives the average diameter of the particles as 0.00132 or 13.2 μ .

Ring No. I.—We turn, therefore, to anatomic investigations to see if there is evidence of cells or fibres having diameters of the approximate amounts specified above. Schiötz⁹ measured the dimensions of the *superficial cells* of the *epithelium* of the *cornea* and found sizes varying from 25 μ to 40 μ . He furthermore found that on exposing the cornea to the action of distilled water for some time he observed a beautiful system of rings of which the first corresponded practically to the Ring I. He remarks that it is a little smaller however, which is readily accounted for by the action of water upon the cells and apertures. These results of Schiötz are in close experimental agreement with the values of the diameters of the particles obtained by Druault in 1899. This latter writer found a value of $\theta = 2^\circ 12'$ for sodium light

of 5,900 t. m., which gives a value of D (diameter of the particles as an average), equal to 0.0025 cm. or 25 μ . And again, Druault found, on looking through a dead cornea, a ring the dimensions of which differed but little from those of Ring I and which he claims was undoubtedly due to the *endothelium* of *Descemet's membrane*, for he could remove the entire epithelium of the anterior corneal surface without producing any effect, but the ring disappeared as soon as the endothelial layer was touched.

Ring No. II—The ring No. II Druault attributes to the crystalline fibers which are arranged in the form of a network or grating. The size of the openings or slits between these fibers can be calculated from the formula for a series of parallel rulings (i. e., plane grating), which states that $m\lambda = d \sin \theta$, where d is the slit width. If such is done, using Druault's data, we find that

$$d = \frac{m\lambda}{\sin \theta} = \frac{0.59}{\sin 3^\circ 33'} = 9.5\mu$$

Anatomists¹⁰ (see Norris and Oliver¹⁰), tell us that the superficial lens fibres measure from 0.0010 cm. to 0.0012 cm. or 10 μ to 12 μ . Hence, if these lens fibers were, in the main, parallel each to each, giving a series of parallel slits, it

would be justifiable to apply the formula given above for diffraction by parallel slits. However, we know that the lens fibers are parallel only in so far as the major portion of those forming any one sector of the "lens-star" may be considered parallel. Likewise, if these fibers were in the main parallel we should obtain the phenomenon of diffraction by parallel slits; which shows a linear spectrum and not circular as in the case of apertures or discs. Such a linear spec-

diminished and that the edge of the ring nearest the light source which is being cut off by a straight-edge shoved in front of the eye is made invisible first of all, if indeed any such effect actually takes place. There is theoretically no reason why the covering up of a portion of the pupil by a screen should produce different effects upon the diffraction phenomena, whether these phenomena be due to parallel slits, apertures, discs or what not; hence there is no good reason

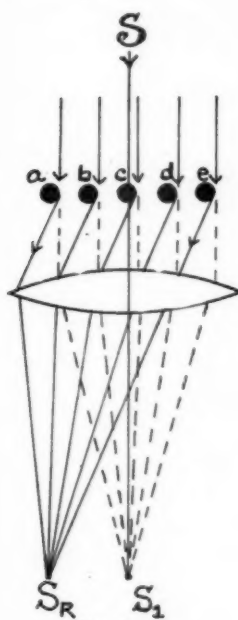


Fig. 5



Fig. 6

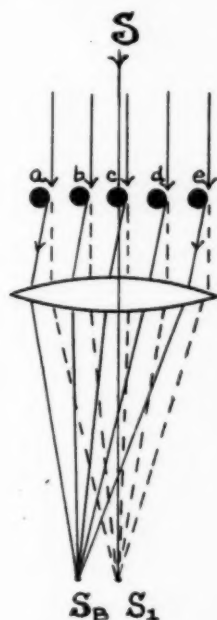


Fig. 7

Figs. 5, 6 and 7; diagrams showing formation of images of different colors from the light diffracted at three different angles. See p. 190.

trum is not experimentally found. Hence the use of the above formula for parallel slits does not seem to be in order.

Druault says that ring No. I disappears completely if one part of the pupil is covered. In the case of ring No. II, however, such a procedure causes only the corresponding part of the ring to disappear, and the other part to become much more regular. Careful observations made by the writer on his own eyes, and the answers made by two or three competent observers, have evidenced the fact that Ring I does not disappear in toto as the pupil is covered; but that, instead, the luminosity of the whole ring is

that we know of why Druault should have observed such widely different effects in the two rings. He reports that he succeeded in reproducing the phenomena with dead crystalline lenses.

If we grant that the lens fibers are not parallel in toto but by sectors, and that these sectors vary in position as we pass into the crystalline, then the total effect would be that due to meshes similar in form to fine meshed wire netting and we should expect the same general type of phenomenon as would be exhibited by such fine meshes. These we do not find experimentally. Moreover, if this second ring (No. II) is due to the

crystalline lens fibers it is peculiar that this ring does not ordinarily appear without dilatation of the pupil. Furthermore, if the second ring is due to lens fibers, then it is presumably the first order spectrum and should have an intensity of about $1/20$ (see Wood's *Optics* or Preston's *Light*) of the original light source; whereas ring No. I, having an intensity not in excess of $1/50$ of the original light source, is readily seen. Hence ring No. II should be brighter and more readily seen if Druault's explanation is correct. Of course, there may be argued against this the fact of the difference in the retinal distribution of light in the two rings. However, the blue of the second ring lies very close to the red of the first one, hence such disparity would not be expected. The writer of this paper believes that the most logical source of the second ring is the layer or layers of deeper epithelium lying close to the anterior limiting membrane.

We have too little data upon the points taken up in the discussion of the preceding paragraph to draw any definite conclusions with respect to ring No. II. The writer is in hopes of interesting a colleague, who is a skilled anatomist, in this subject with the view to carrying out an extensive and joint series of investigations upon the seat (or seats) of these diffraction effects.

THE CILIARY CORONA.

The ciliary corona, with its luminous dust and striae, is without doubt due to the lens fibers in part and again in part to the lens star. These fibers and lens star are known to exist subjectively as the result of unequal refraction of light by the various sectors into which the crystalline lens is roughly divided. The pronounced criss-crossing of sectors of lens fibers in different layers, and the fine mesh appearance developed, serve admirably to account for the appearance or character of the luminosity immediately surrounding the light source.

Glaucomatous patients may see rings which resemble those described in the preceding paragraphs. In cases of glaucoma, however, these rings are larger and assume an angular diameter of 10° to 12° . Since the size of the ring increases as the distance between corpuscles or cells producing them decreases, Schiötz¹¹ attributes the origin of the glaucomatous rings to the deepest layer of the corneal epithelium. Experiments on pigs' corneae, so arranged that salt water could be forced into them, showed that a large circle of diffraction was produced when the liquid penetrated into the deeper epithelial layers.

CONCLUSIONS.

In résumé of the results detailed in this paper we note:

(1) The universality of colored rings and coronae surrounding luminous sources under fairly favorable conditions of observation.

(2) These rings are due to the diffraction of light by the constituent parts of one (or more) of the ocular media.

(3) The results of experimentation, based on the theory of diffraction of circular particles or discs, when compared with anatomic data indicate that the *first* (which is commonly the only one seen) ring is due to diffraction by the cells of the anterior epithelial layer of the cornea or possibly to the endothelium of Descemet's membrane (Druault).

(4) The *second* ring is evidently due to diffraction by particles of a smaller size than those which produce the first ring. The writer suggests the inner layers of the anterior epithelial portion of the cornea. This ring has been attributed by Druault to the lens fibers, but reasons are advanced indicating that such a view is not probable.

(5) The *ciliary corona* is without doubt due to the lens fibers and the *striae* to the lens star.

BIBLIOGRAPHY.

1. Carter. Appearance of Color Spectra to the Aged. *Nature*, Nov. 8th, 1917.
2. Sheard. Physiological Optics. *American Encyclopedia of Ophthalmology*, vol. xiii, pages 9886-8.
3. Chance. Digest of Literature. *Amer. Jour. Ophth.*, vol. 1, p. 150.

4. Tscherning. Physiologic Optics, page 157.
5. Druault. Archives d'Ophtalmologie, March, 1898, and Compte rendu du Congress d'Utrecht, 1899.
6. Preston. Theory of Light, pp. 222-226, and 288-291.
7. Wood. Physical Optics (First edition) pages 188-192.
8. Verdet. Optique Physique.
9. American Encyclopedia of Ophthalmology, vol. 1, page 380.
10. Norris and Oliver. System of the Eye, vol. 1, page 355.
11. Schiötz. Om nogle optiske equeskaber ved. cornea, Christiania, 1882.

A TENDON TUCKER

WESLEY BISHOP, M. D.

MINNEAPOLIS.

This is a description of an instrument devised for rendering the tucking operation easier and more exact, and which can be used to measure the amount of advancement required. With illustration of results.

The correction of strabismus by a tucking operation has appealed to me but certain disadvantages apparent while

ful in shortening the externus; in shortening the internus, however, it will be found, like other tuckers, not



Fig. 1. Tendon tucker, front and side view.

using the various forms of tucker have provoked an attempt to modify the procedure by supplying an instrument which, while simplifying the operation, promises accuracy in the attempt to procure parallelism of the eyes.

The performance of this operation under general anesthesia must of necessity entail more or less haphazard guesswork as to the result. To procure parallelism, the coöperation of the patient becomes an important factor; and to this end the operation should be performed under local anesthesia. It is here that we have met with our greatest trial, the pain caused by the traction on the muscle during the formation of the tuck being sufficient to seriously interfere with the patient's attempt at fixation. Again: The placing of sutures, with the muscle tightly stretched against the eyeball, is not without difficulties, especially when using certain forms of tucker.

The instrument herein described and illustrated (Fig. 1), I have found use-

so easy to handle on account of the lack of working space.

It is simple in construction, easy of application, and eliminates the objec-



Fig. 2. Tendon tucker, showing raised loop of muscle.



Fig. Case before operation.

tions mentioned. Briefly it consists of a double standard, each leg of which terminates in a cross-bar base; to form the support for a flat hook, which operates between the standards, being raised or lowered by means of a thumbscrew.

OPERATION.

A few drops of four per cent cocain adrenalin solution are instilled at one minute intervals. As usual the conjunctival and capsular flaps are dissected back, exposing fully the muscle to be shortened, and upon this a drop of ten per cent cocain solution is now dropped.

The instrument is held perpendicular to the muscle, with the cross-bars forming its base squarely at right angles to the edge of the muscle, the hook being under it. To form the tuck the hook is raised by means of the thumbscrew, carrying upon it the muscle, as illustrated, thus raising a loop of muscle between the two standards.

With the patient looking straight ahead, the hook is raised until parallelism of the eyes is obtained, then a 00 pyoktanin cat-gut (20 day), suture is passed thru each

side of the tuck at its base in the angle formed by the upright of each standard with its cross-bar base. The width of the standards separates the sutures and incidentally protects the central blood supply of the muscle. By reversing the thumbscrew the hook is now lowered and the instrument removed, the flaps are then sutured in place and the toilet of the wound completed.

It is astonishing, after noting the discomfort produced ordinarily by the tucking operation, to watch the formation of the tuck proceeding with absolutely no complaint from the patient. This we believe is due to the fact that during the formation of the tuck with this instrument, the traction on the muscle is in one direction; whereas with other instruments this traction is in two opposite directions, thus causing more pressure on the muscle fibers.

The placing of sutures is easy and accurate, as the upright standards offer no obstruction and the angle formed by each with its cross-bar base provides the determining point of suture.

When one prefers not to perform the tucking operation, the instrument may



Fig. 4. Case after operation.

be used to predetermine the position of sutures in making an advancement. In such case the instrument is placed with one standard directly over the insertion of the tendon and a tuck formed until parallelism of the eyes is obtained. A suture is then passed thru the base of the tuck, but going thru only that side of the tuck farthest from the tendon insertion. The instrument is then removed, allow-

ing the tendon to flatten out again. The distance between tendon insertion and the suture measures the amount of shortening required.

The accompanying photographs, Figs. 3 and 4, illustrate an extreme case of convergent strabismus in which the left externus was shortened seven-eighths of an inch with absolutely no discomfort to the patient.

TRANSPLANTATION OF PORTIONS OF VERTICAL RECTI FOR ABDUCENS PARALYSIS WITH SUCCESSFUL RESULT.

RODERIC O'CONNOR, M.D.

OAKLAND, CALIFORNIA.

This paper records a case operated upon with a partly new technic giving the final result obtained, and an explanation regarding the outward rotation secured.

E. C., age 8, seen first July 29, 1916. Right eye squinting inwards, approximately 35° arc. Mother certain that this condition had existed since her second year, possibly longer.

Repeated examinations and trials failed to demonstrate an outward rota-

tion, even to the primary position. This was not contrariness as she would rotate the other eye outward freely in following a test light.

There is no doubt therefore that the case was one of complete paralysis of the right external rectus; and she was con-

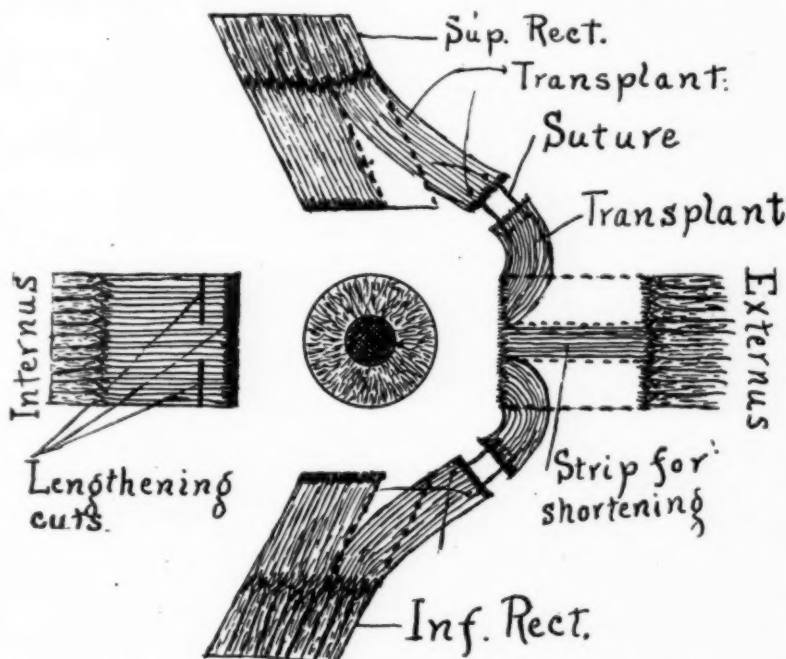


Fig. 1. The suture when tied draws the bared externus transplant well under the transplant from its respective vertical rectus.

sidered a suitable case for the transplantation operation. This was done on August 4, 1916, under general anesthesia. In as much as the technic differed in two points from that employed by others in similar cases, I deem it worth while to go into detail and to try to show it in a sketch projected to a common vertical plane. Fig. 1.

The externus and outer portions of the vertical recti were exposed thru a long

width. The two lateral ones were then cut out free, well within the fibrous portion of their junction with the muscle tissue, for exactly the same reason that the vertical recti were shaved from the sclera.

The object of the above procedures was to permit a good overlap with the vertical recti slips, without undue tension on the stitches.

The central tongue of the externus was

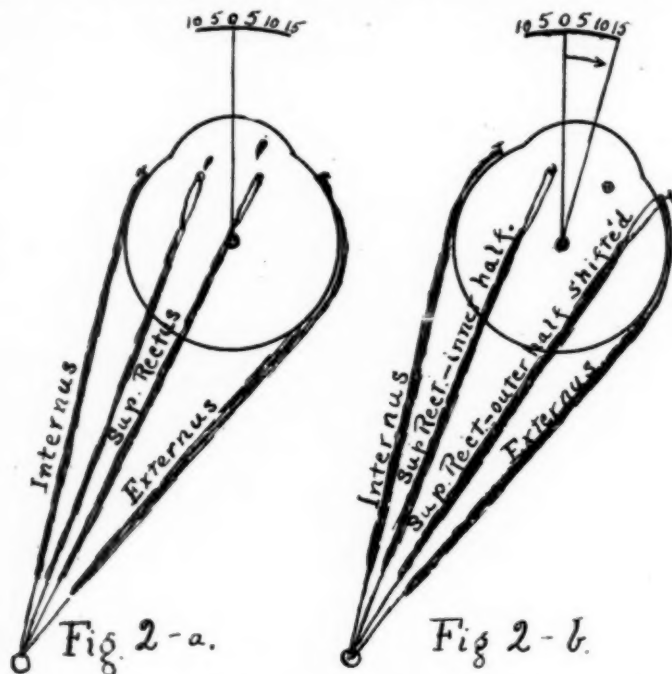


Fig. 2. Diagram showing influence of superior rectus (a) with normal attachment (b) after attaching external fibers to externus.

incision concentric with the cornea and about 1 c.m. distant therefrom.

The outer third of each vertical rectus tendon was isolated with its superimposed capsule of Tenon, split far back, and shaved off the sclera. This I consider a very important point because in this way the fibrous attachment is included which will hold a stitch from slipping out. If the cut is made back of this point, the stitch will slip out along the parallel tendon fibers, unless tied so tightly as to cut itself out by necrosis.

The externus tendon was next isolated freely, *bared of its capsule* and divided lengthwise into three portions of equal

then shortened by my double hitch method as described in my paper before the ophthalmologic section of the A. M. A. at Detroit in 1916. This was done in hopes of relieving some of the tension on the sutures, as well as partially correcting, in itself, some of the squint.

The upper section of the externus was then united to the transplant from superior rectus, by a mattress suture inserted as shown in the sketch. Then the lower section to inferior rectus was similarly united to the transplant from the inferior rectus. Conjunctiva then sutured.

The internus was not touched because I wished to prove positively that anything

gained in position or outward rotation was due entirely to the transplant.

August 7th. Wound healing nicely. Marked improvement in position. Rotation not tested.

August 9th. A slight outward rotation now present in spite of swelling.

August 21st. Outward rotation now up to 25° . About 10° of remaining convergence. On this date therefore the internus was lengthened by my multiple cut method (similar to Verhoeff's.) See Fig. 1 lengthening cuts.

August 23rd. Eyes parallel. Outward rotation 35° .

August 25th. As on 23rd. Right rotation practically parallel except at extreme limit of motion.

August 28th. Outward rotation 45° on perimeter by reflection test. Wound healed and dressing omitted.

September 12, 1916. As on August 28th.

February 2, 1917. Rotation and appearance as on September 12, 1916.

April 27, 1917. As on February 2, 1917.

August 16, 1918. Esophoria 1° in primary position. R. rotates outward 35° easily. No diplopia within limits of glasses. So there is a perfect cosmetic result and for all positions near the primary, practically a perfect functional result.

When this case was presented before the eye section of the San Francisco County Medical Society, the general request was to explain the outward rotation. My idea on this point is as follows: It is well known that the vertical recti act as secondary abductors at all positions beyond 27° arc from the primary. This

being so when we alter the mechanics of their attachments (1) by broadening, (2) lowering to a point closer to the equator we markedly increase the leverage in the outward direction so that rotation, by their action, will occur before the 27° position is reached. Figure 2 is a diagrammatic sketch of a model I constructed to explain the result.

Figure 2 (a) shows all muscles in balance for primary position, the muscles being thread rubber and the superior rectus made up of two threads, for diagrammatic purposes only.

Figure 2 (b) shows that a shift of the outer half of the superior rectus to the externus, without changing tension of any other bands, will abduct the anterior pole thru a 15° arc.

Another experiment balancing the muscles for a 10° convergent position, the best outward rotation possible in abducens paralysis, and then making the shift of outer half of the superior rectus, brings the anterior pole to primary position.

I think when we did add the power of a functional innervation to help the mechanical alterations, we had a sufficient explanation for the occurrence of outward rotation.

In another case done under a local anesthetic on an extremely unruly patient, I was not so successful, obtaining only 15° outward rotation. In this case because of his behavior the technics were not completed to my own satisfaction, as I was unable to secure wide enough transplants or to split them far enough back to allow of easy overlapping with sections from the externus.

NOTES, CASES AND INSTRUMENTS

CASE OF DOUBLE RETINAL SEPARATION IN TRENCH NEPHRITIS.

LT.-COL. GEORGE S. DERBY, M. C.,
A. E. F.

Authority to publish granted by Board of Publication, Surgeon General's Office.

Binocular retinal separation in nephritis is a comparatively, rare condi-

tion and seldom, if ever, in civil life, does the disease terminate in the recovery of the patient. Furthermore, this condition has been seldom seen in so-called trench nephritis. It seems, therefore, worth while to put the following case on record:

W. S. 97 M. G. C., 19 years of age, entered 13 General Hospital, B. E. F. on January 2nd, 1918. He was placed

under the care of Captains Thompson and Keith of the R. A. M. C., who were doing special work on trench nephritis, and who, I believe, have reported this case, from the standpoint of nephritis, elsewhere. Patient had a severe bronchitis in December, 1916, and had rheumatism since. December 20th, 1917, he began to cough and had feelings of general malaise. Edema of the face appeared on December 25th, dyspnea on December 26th with pains in his legs and feet.

began to improve. A note from Captain Thompson states that at the beginning of his illness he had a marked edema of the conjunctiva which later disappeared.

On March 29th Captain Thompson asked me to see the case. Examination right and left showed a very marked neuroretinitis with some swelling of the disc and hemorrhages and areas of pigmentation thruout the fundus, together with whitish areas of degeneration. Changes were more marked

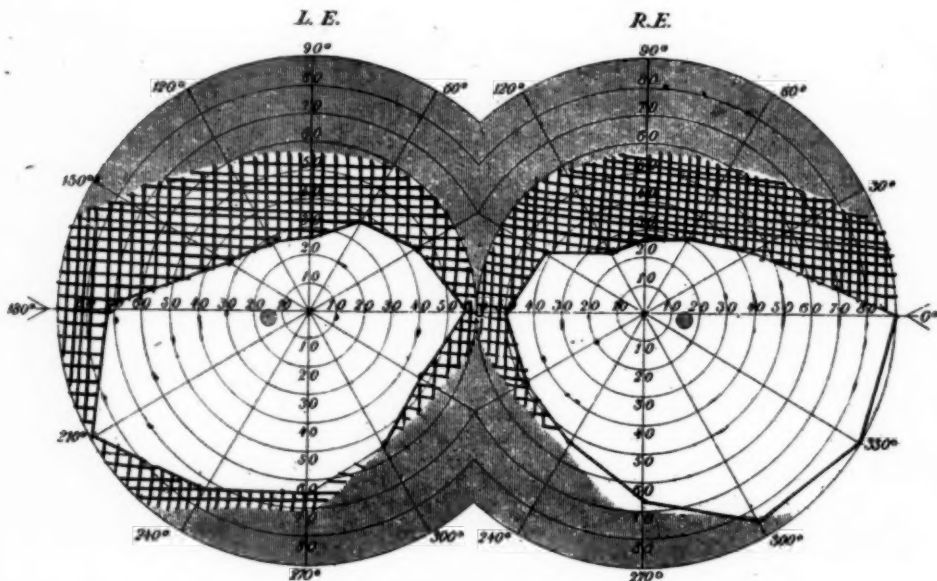


Fig. 1. Fields of vision in retinal detachment after improvement had begun.

Physical examination showed in brief; marked edema of face, limbs, and trunk, tonsils large, systolic murmur third intercostal space. Second sound plus. Dullness in posterior bases but no rales. Blood pressure of 145/85. Urine showed unmistakable evidence of acute nephritis and he ran a very severe course. For a considerable period, he was on the dangerously ill list.

On February 25th his eye grounds were examined by Captain Keith and obscuring of the disc margins was observed, otherwise nothing. About this time his sight began to get poorer and on March 16th he could not see much of anything. Subsequently his sight

in the left eye. In both the right and left eyes were found marked separation of the retina downward, reaching almost up to the macula region and the disc. Vitreous opacities were present in both eyes.

At this time the patient was markedly improved in general condition and he stated that his eyesight was considerably better. V. R. = 6/18, V. L. = 6/26. The fields showed contraction as indicated on the chart. At the time the patient was seen he was considered to be convalescent and ready to be returned to England. His urine had practically cleared up. I, however, prevailed on Captain Thompson

to keep him for three weeks longer and let me watch his eyes during that period.

During the next three weeks a diminution in the separation of the retina in each eye was observed and a continuous, tho small, improvement in the field of vision was noted. On April 23rd, a few fresh hemorrhages were present in the fundi, but the separation had disappeared in each eye. The limits of the field had practically enlarged to normal, being 42 degrees upward in the right eye and 46 degrees in the left. His vision at that time was, right 6/12 minus, and left 6/18 minus. A month after his arrival in England he was heard from and was apparently progressing well.

BILATERAL TUBERCULOMA OF THE ORBITAL LACRIMAL GLANDS.

HARRY VANDERBILT WÜRDEMANN,
CAPT. M. C.,

BASE HOSPITAL, CAMP LEWIS,
WASHINGTON.

Without present access to the literature I can not recall to mind any cases of tuberculosis of the lacrimal glands; but surely such have occurred and have been noted.

Mrs. M. W., aged 40, colored, May 27, 1918, referred by Dr. Gates, of Seattle, complained of pressure upon eyeballs, headaches, poor sight and her unsightly appearance from protruding eyes, which had come on within two years.

Had syphilis four years ago with ++ Wassermann, three years treatment, no present symptoms. No treatment for nearly a year. A well developed adult, negro-indian descent. Family history negative, except one sister had died of phthisis pulmonalis. Physical examination negative, except for chloasma of face and the condition of eyes.

Bilateral nodular tumors of both orbits in site of lacrimal glands, causing an apparent exophthalmus with "frog face."

V. R. 6/xx, L. 6/xx, R. + 1.50, \ominus

+ 0.62. cy. ax. $90^\circ = 6/xx$. L. + 2.00, \ominus + 0.62 cy. ax. $90^\circ = 6/xx$. No diplopia or muscular error, no fundus lesions, no real exophthalmus. Nose, throat and lymphatics normal. Wassermann negative, urine and blood negative.

The history practically excluding luetic gumma or osteoid changes, a tentative diagnosis of tumors of the orbit, possibly of the lacrimal glands, was made; and advice given of observation for a month or two before probable operation.

September 9, 1918. Minor Hospital, Seattle. Dr. C. R. Rion, ether anesthesia. Typical excision thru eyebrow incision on right side, of a very large, hard, nodulated orbital lacrimal gland in its entirety. September 17, 1918. Minor Hospital. Excision of a like tumorous gland from the left side; Dr. Fredk. Adams assisting, Dr. C. R. Rion, anesthesia. On neither side was the palpebral gland found involved, and on both sides the glands were shelled out by blunt dissection with but little difficulty. On the right side immediate union was found on first dressing on the fourth day; but one week later, altho the site of the operative area healed, a sulcus of about 3 cm. formed above the eyebrow which after two weeks showed no signs of healing, but was rather progressing, dissecting up the periosteum of the forehead. Then the report of the pathologist had come in showing unsuspected tuberculosis of the gland. The patient was then given 15 Tb. injections by Dr. Gates. Under these, together with diamzon ointment locally, healing was completed within eight weeks.

The left side, however, healed by first intention and no dressings were necessary after the 10th day.

REPORT OF PATHOLOGIST.

Macroscopic.—Gland 3x2x1 cm. in size. Markedly indurated but smooth and of even contour. Cross section discloses homogeneity of tissue resembling sarcoma.

Microscopic.—Connective tissue hyperplasia has widely separated the gland acini, until it has an adenomatous appear-

ance. Thruout is more or less dense small, round, cell infiltration. Here and there thruout entire section are remains and portions of ideal microscopic tubercles, consisting of epithelioid cells, giant cells and small cell infiltration.

More rarely an ideal microscopic tubercle is seen.

Diagnosis.—Tuberculosis of the lacrimal gland.

Date, September 19, 1918.

Examined by O. J. West, M. D.

REMARKS ON LACRIMATION AFTER REMOVAL OF THE LACRIMAL GLANDS.

There are two lacrimal glands for either eye, the major or orbital, the minor or palpebral. Removal of the latter almost totally restricts the formation of the lacrimal fluid, even in weeping, for the ducts are abated and the communication with the superior or orbital gland cut off, which then goes on to more or less atrophy.

Removal of the orbital gland but partially diminishes the lacrimal secretion, tho it is lower than the physiologic normal. Even true weeping occurs from grief or irritant stimulation.

Removal of both orbital and palpebral portions, or the palpebral gland alone, gives a dry eye for ten days or so; but soon compensation occurs, enough watery fluids being secreted to fully lubricate the conjunctiva.

**SPASM OF ACCOMMODATION
WITH DISTURBANCE OF OC-
ULAR MOVEMENTS OF
DENTAL ORIGIN.**

GILBERT D. MURRAY.

SCRANTON, PA.

M. J.—Machinist, age 50 presented himself at the office on October 22nd, wearing an anxious look, and said he

had been obliged for the last week to quit work on account of his eyes. Patient complained that every time he looked away from the median line, either to the right, left, up or down he would become so dizzy as to almost fall. This dizziness was accompanied by severe pain in the eyes and temples. He could see his work without any difficulty when looking directly at it.

Vision was 20/20 each eye; presbyopic, one diopter. Exophoria, with plus 2 spherical, he could see one meter type to 12 or 13 inches. This type could not be seen beyond and within this range. While looking at a pencil held in different parts of the field he would almost fall off the chair from dizziness. Physically he was well nourished, though pale. Blood pressure 120. Urine, pupils, and fundus negative. Teeth had all been removed, except six incisors which were badly worn but looked so sound that the doctor who made the X-ray thought it a useless procedure. Locomotion and hearing negative. Headaches for three weeks preceded the dizziness which brought him to the office. Both eyes showed incipient cataracts.

The skiagrams made of the teeth showed three large abscesses at the apices and one unerupted tooth immediately beneath the abscess. Both unerupted tooth and abscessed teeth were removed, and the man's headaches and dizziness were completely and promptly relieved. Plus spherical 2 D. lenses were ordered for near work. One meter type read then 8 to 22 inches.

It is not unusual to have iritis, eczema of lids, pain in eyeballs, etc., directly traceable to apical abscesses of the teeth, but this is the first case of spasm of accommodation noticed by the writer. The patient has been working one month and has had no return of the trouble.

SOCIETY PROCEEDINGS

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS OF PHILADELPHIA.

November 21, 1918.

DR. S. LEWIS ZIEGLER, Acting Chairman.

Retraction of the Globe in Adduction.

DR. WM. ZENTMAYER presented a male, aged five years. At the age of seven months the mother noticed that the left eye "rolled about in the head," and says that this has persisted. With eyes in primary position there was a very slight narrowing of the palpebral fissure on the left side. The right was normal. See Fig. 1.

In looking to the left, Fig. 2 (p. 204), the outward rotation of the left eye was limited. In looking to the right the left eye became retracted, a distinct space could be seen between the inner surface of the lower lid and the globe, and the palpebral fissure became distinctly narrowed. If the fixation was a little higher than the horizontal plane instead of the eyeball rotating strongly inward in adduction, when it reached a point just to the inner side of the middle line the eye shot strongly up. Fig. 3 (p. 204). If fixation to the right was a little below the horizontal plane the adduction was increased, but no supraduction occurred.

The fundus was normal and the refraction error was a low H. + As., against the rule. Turk's theory probably best explains this symptom-complex. His view is that the retraction is due to inflexibility of the external rectus muscle of the eye, showing the phenomena. The oblique movements of the globe Duane attributes to spasmodic contracture of the inferior oblique. Parker attributes the closure of the fissure to some peculiar associated movement produced by synergic action of the facial and oculomotor nerves.

The fact that in this case the upward shoot of the eye, while occurring at

times when the eye is rotated directly to the right, manifests itself always and more strongly if the fixation is slightly above the horizontal plane suggest that this contraction of the inferior oblique may be due to a slight paresis of the superior rectus muscle of the opposite eye.



Fig. 1. Showing eyes in ordinary position.

Unilateral Vertical Nystagmus.

DR. ZENTMAYER showed a girl, aged fifteen years. She had measles at three years of age, complicated with otitis media purulenta on the left side, and esotropia of the left eye. Two years ago glasses were prescribed and the esotropia disappeared. The eyes are now stationary under cover. The left eye presented a vertical nystagmus. The movements were rather slow. The right eye by naked eye examination seems to be without nystagmic movements. Nor could they be detected with the ophthalmoscope until the pupil was enlarged and the optic papilla



Fig. 2. Showing retraction of L. E. in adduction. Note narrowing of fissure. P. 203.

closely watched when very slight vertical motion was detected.

Most of the cases of so-called unilateral nystagmus prove on careful study to be really anisonystagmic.

Pigmentation of the Excavation of the Papilla.

DR. ZENTMAYER exhibited a colored woman, aged twenty-seven years, who came to Wills Hospital because of asthenopia, right-sided pain in the head and recurrent styes on the left side. In R. E. there was a small vacuole in the lens. The papilla was oval axis 95° and presented an unusually large excavation involving four-fifths of its surface. It was of the undermined type. Within the limits of the excavation on the temporal side there was a dark-gray crescent. The pigment seemed to be on the outer wall of the excavation. Contiguous with this, outside of the excavation, which extended up to the scleral ring, there was a cone of pigment of much the same tint. In the L. E. the appearances were identi-

cal. The refraction error is a low H. As.

Tuberculoma of the Iris.

DR. ZENTMAYER showed a colored girl, aged six years, the history of whose case had not been unsatisfactory. The L. E. had been inflamed several weeks, attributed to a finger-nail scratch. There was a yellow-white oval mass 4×5 mm. occupying the angle of the anterior chamber and pressing upon the cornea. The cornea was very hazy and the epithelium shagreened. The pupil dilated on the temporal side. No detailed view of the fundus. T-n. Moderate ciliary congestion. Upper incisors slightly notched. Wassermann negative. von Pirquet positive. After the inoculation a small gray focus of infiltration appeared in the cornea. Animal inoculation will be performed to confirm the diagnosis.

Successful Extraction of an Opaque and Dislocated Lens.

DR. HOWARD E. HANSELL presented a woman, aged forty-five years, who



Fig. 3. Showing occasional upward shoot of L. E. in adduction. P. 203.

complained of gradually increasing loss of vision for ten or more years. A diffuse uniform opacity involved the entire lens of each eye. She had frequently sought surgical aid but had been refused.

A preliminary iridectomy on each eye was performed. A slight escape of vitreous followed in each eye, drawing attention for the first time to the dislocation of the lenses. The wounds



Fig. 4. Case II. Showing retraction of left eye in adduction. Note narrowing of fissure. P. 203.

healed promptly altho final recovery was slow.

The left lens was extracted a few weeks later by the wire loop with the loss of an insignificant amount of vitreous. Recovery uneventful. Final vision with correcting glass = 20/20.

The success of the operation was due in great part, if not altogether, to the large conjunctival flap, prepared before making the limbus incision, and drawn completely over the wound after the lens was extracted.

Dr. Krauss recalled the case of an aged man, who dislocated a cataractous lens into the anterior chamber, by slipping in taking a bath. The eye became

painful. The lens was successfully removed with a loop with splendid visual results.

Acne Rosacea Keratitis.

DR. J. MILTON GRISCOM exhibited a patient who had complained of sore eyes during the past eight months. She was forty-seven years old, a heavy eater and suffered from chronic constipation. For the past two years she had suffered from a typical acne rosacea involving her nose, chin and cheeks, which appeared at about the time her menopause first manifested itself. When first seen the bulbar conjunctiva of both eyes showed numerous pinhead sized elevations adjacent to the cornea resembling phlyctenules with marked injection. On the corneæ near the limbus were several areas of superficial infiltration about 2 mm. in diameter surmounted by whitish necrotic tissue the size of a large pinhead. There was a band of superficial blood-vessels running from the limbus on both nasal and temporal sides. The remainder of the cornea was clear and the other ocular structures were free from disease.

Probable Intraocular Growth.

DR. G. ORAM RING presented a preliminary report of an interesting case which involved a "Question of Diagnosis," as between malignant disease of the retina, and the other pathologic conditions, with which it can be confounded.

The patient, E. B., aged eleven months, has been under observation for two weeks only. The child had enjoyed perfect health from birth, until one month before being seen by Dr. Ring, when without the slightest premonition she had a convulsion. Two days previously, the patient swallowed a very hard cough drop, which was passed in forty-eight hours. During the same period the mother was suffering with influenza (temperature 102°), and had regularly nursed the child. With the onset of the convulsion, the child was immediately weaned.

Tuberculosis and syphilis were excluded, as was malignant disease in the family history. Barring the ocular con-

dition, the child was in all respects normal. The morning following the convulsion, the eyelids of the right eye were greatly swollen, and remained so for one week, at which time a "white skin" over the sight was observed by the mother.

At the initial hospital examination there was a moderate lid swelling and a general pericorneal and conjunctival flush. The cornea was slightly hazy, the anterior chamber quite shallow, the periphery of the iris retracted into a definite sulcus, especially down and out, the pupillary edge being pushed forward to the posterior corneal surface, the iris thus forming an almost right-angled curve. The pupil was vertically oval, the lens slightly hazy, irregularly swollen and pushed forward, especially in the center and to the temporal side. The reflex was pinkish white and proceeded from the anterior part of the vitreous. Across this mass ran a large and dilated bloodvessel. The tension was definitely minus, and transillumination gave only a faint reflex up and in.

Dr. Ring reviewed the points in differential diagnosis, of simple, retinal detachment, tubercular choroiditis, cysticerci, congenital anomalies, metastatic choroiditis, retinitis with massive exudation, retinitis circinata, and dropsical degeneration of the rod and cone visual cells (de Schweinitz and Shumway), and leaned to the diagnosis of retinal glioma, expressing the possibility that a metastatic influenzal toxemia may have played a minor role in inducing the ocular picture presented.

Dr. S. D. Risley said that Dr. Ring had kindly given him the opportunity to study the case in consultation. He had rarely seen any example of disease which gave wider opportunity for differences of opinion as to its essential character. Dr. Ring's careful and elaborate analysis had left little opportunity for additional comment. The sudden onset of convulsions with subsequent expulsion of a foreign body from the bowel, followed by the inflammatory conditions in the eye with loss of vision, due to an extensive detachment of the retina accompanied by objective

signs of an underlying neoplasm opaque to transillumination, is certainly an unusual history. While there is the possibility that the intestinal conditions leading to the convulsions had caused a general toxemia which found local expression in the eye as a general retinal or subretinal edema; or possibly a choroidal hemorrhage which would be opaque to transillumination, nevertheless, careful study of the eye left the positive impression of the presence of a new growth.

In the presence of the extensive detachment of the retina, he did not feel that the diminished tension of the ball necessarily contraindicated the presence of a new growth, as he had many times seen examples of detachment of the retina, where subsequent enucleation had demonstrated the presence of a sarcoma, but which had nevertheless presented normal or diminished tension as part of the clinical picture. Notwithstanding this somewhat definite statement of opinion, he nevertheless felt that the questionable diagnosis could be rendered definite only by the laboratory study of the eye, and he hoped that Dr. Ring would at a subsequent meeting of the Section inform the Fellows as to the pathologic finding.

Dr. Zentmayer said there were two statements in Dr. Ring's paper which were open to discussion. Dr. Ring states that detachment of the retina could be excluded because of the absence of trauma and of a refraction error of sufficient degree to cause it. These, however, were not all of the causes of detachment and there was one pertinent to the diagnosis in his case. Nettleship first described the condition, and there have been several since reported, one by Dr. Zentmayer in which the picture of glioma was due to detachment of the retina the result of the subretinal presence of a serous fluid containing cholesterol, the probable remnants of an extension hemorrhage. These cases have usually a history of a preceding exanthem, commonly measles. As to the value of the intraocular T. in diagnosis Dr. Zent-

mayer's personal experience was at variance with that of many clinicians. He had never met with minus T. in an eye with a well-defined intraocular tumor, unless, perforation of the coats of the eye had occurred or an iridocyclitis had developed. He had, however, met with plus T. in pseudoglioma. Personally, therefore, he would consider a decided plus T. to strongly favor a diagnosis of glioma and a decidedly minus T. to almost surely exclude this diagnosis.

Dr. Hansell said the careful clinical analysis of the pathologic changes so graphically depicted by Dr. Ring point to but one interpretation, namely, glioma of the retina. He examined the patient at Dr. Ring's request upon two occasions at an interval of a few days. During that time the disease had perceptibly advanced. The vitreous body was completely filled by a white mass, the lens pushed forward until the anterior chamber was almost annihilated. The rapid growth, the characteristically white appearance of the tumor, the absence of history of any of the usual causes of pseudoglioma, made the diagnosis almost certain.

J. MILTON GRISCOM, M. D.,
Clerk.

JOINT MEETING OF THE CHICAGO OPHTHALMOLOGICAL AND CHICAGO MEDICAL SOCIETIES.

December 18, 1918.

Fourteen Points Concerning Ophthalmia Neonatorum.

DR. FRANK ALLPORT had endeavored to formulate fourteen points which he considered especially important in connection with this subject.

First: Ophthalmia neonatorum is responsible for about 20 per cent of the blind in the United States, and for about 25 per cent of inmates of blind asylums.

Second: It costs about \$30.00 a year to educate an ordinary child, and about \$400.00 a year to educate and care for a blind child.

Third: There are about fifty blind schools in the United States, costing about \$2,000,000 a year to maintain.

Fourth: Ophthalmia neonatorum costs the United States about \$7,000,000 per annum in actual money.

Fifth: Next to optic nerve atrophy, ophthalmia neonatorum is the most prolific cause of blindness in the United States.

Sixth: The Credé treatment for all new-born children would almost entirely eliminate this disease and its dreadful consequences from the world.

Seventh: The use of this evidently necessary treatment is by no means universal, and its omission is not confined to midwives. In order to accomplish its purpose the use of this treatment should be invariable. It should be understood that gonorrhea is not the only condition that will produce this disease, but that it may occur from other and nondisgraceful causes.

Eighth: Midwives are a financial and sociologic necessity. Fully one-half of the confinements are attended by midwives. If it were not for these midwives most of these cases would be merely looked after by friends and relatives. Midwives should be educated, examined, licensed and inspected, and should always call in medical assistance in complicated cases.

Ninth: Births should be compulsorily reported within a few hours. The ocular condition should be reported, and the physician should state whether or not he has used the prophylactic treatment.

Tenth: Suitable laws should be passed in each state providing for the invariable use of Credé prophylaxis in all newly born children, and proper penalties should be imposed for the non-observance of such instruction. Every legitimate method of educating and enlightening the people, the midwives and the doctors should be encouraged.

Eleventh: While not prophesying as to what the future may produce in the way of prophylaxis, it is reasonably certain that at present there is no remedy that can take the place of nitrat of silver. It alone has stood the test of time. In order to provide free and re-

liable silver solutions some states and cities prepare and distribute fresh and carefully compounded solutions to doctors and midwives on application.

Twelfth: One almost insurmountable difficulty in the way of proper treatment of ophthalmia neonatorum is the paucity of resources in combating the disease. A small hospital should be established in every large city for the prompt reception of such cases. Or it should be clearly understood by health officers, doctors, midwives, visiting nurses, etc., that certain hospitals will receive such patients, in special wards, at any time, day or night, and undertake to provide expert medical attendance and proper care.

Thirteenth: Health departments in the larger cities should employ an experienced eye nurse to search out and follow up cases of ophthalmia neonatorum, and to see that immediate action is taken when cases are found.

Fourteenth: I believe that great benefit can be accomplished by the free and frequent distribution of brief and pointed pamphlets, printed in several languages, by some central organization, such as the National Committee for the Prevention of Blindness.

The paper contained a sample of what Dr. Allport believed should be covered in such a leaflet.

DISCUSSION.—Dr. Richard J. Tivnen emphasized some of the points brought out by Dr. Allport and thought the outstanding feature of this disease was that it could be prevented. This meant that 25 per cent of the blindness among children could be eliminated, and it was a reflection that even one of these cases, in the light of modern treatment, should have been blind. At one time our Committee on the Prevention of Blindness thought that the best way to prevent ophthalmia neonatorum was thru legislation, but it was soon found that this was a very discouraging and unsatisfactory way of meeting the problem. We then turned to what we afterwards found to be the best plan—education. This “education” should come from within the profession as well as from without.

The one thing that had proved most

effective in preventing this disease was the so-called Credé method of prophylaxis, which was very simple and could be carried out with some simple instruction by anybody. It simply meant the instillation in the infant's eye, following birth, of a drop of 2 per cent solution of nitrat of silver. Many of the obstetric textbooks, however, were lax in their instructions about carrying out this procedure. They failed to say that the only time the solution should be *dropped* in the eye of the infant was immediately after birth and if it required further treatments it was applied to the lids. He knew of one case where it had been dropped in the eyes four or five times a day for a considerable period with disastrous results.

The Credé preventive was the accepted treatment for the prevention of infection, and if the profession would adopt it universally it would be a long step forward in the elimination of blindness due to ophthalmia neonatorum. Education might also with advantage take the form of a more intimate coöperation between the specialists in diseases of the eye and the general practitioner in the handling of these cases, and in the early recognition of the disease. It was idle to talk of preventing blindness if the cases were not recognized and treated early.

The ulcer of the cornea which was so destructive seldom appeared for several days, and was usually preceded by redness, edema and discharge. It could be said that a reddened, discharging eye with a swollen eyelid in the baby at birth was more than suspicious, and should always be investigated and treated. Every eye-man on the staff of every general hospital should insist that he be granted the opportunity to deliver a course of lectures on this subject to the nurses, and public lectures with stereopticon slides which would particularly appeal to the people would have a wonderful effect in bringing about the recognition and dangers of this disease.

Dr. N. C. Nelson reported on the treatment used in this class of cases at the Illinois Charitable Eye and Ear Infirmary. He stated that they saw

many cases that had been treated with the Credé method, and yet developed ophthalmia neonatorum. This was due to one of two things, either the improper application of the silver nitrat solution, or the eyes were infected postpartum by the person delegated to care for the mother and babe. In more than 70 per cent of their cases the infection began from two to ten days after birth, about 50 per cent occurring on the third or fourth day and the other 20 per cent from two weeks to two months after birth.

Owing to their cases coming to the hospital so long after infection began, the percentage in which both eyes were involved was very high, 84 per cent, as compared with only 6 per cent R. E. and 10 per cent L. E. This proved how important it was to have the treatment early. Nearly all cases with only one eye involved came for treatment within the first week and of those only 2 per cent developed infection in the other eye.

In the very acute cases ice was used to the eyes from two to three hours, repeated every four hours for the first twenty-four to thirty-six hours. He did not consider it good policy to keep the ice on constantly as it lowered the vitality of the cornea and thus defeated its purpose. The mother was instructed how to bathe the eyelids with pledgets of cotton soaked in warm boric acid solution every fifteen minutes. The eye was irrigated with great care every two hours in the beginning and later every four hours, every possible precaution being taken to prevent injury of the cornea. A one-half per cent solution of atropin was used three times daily to cure the iritis or prevent its development.

Some form of silver was usually dropped in the eye three or four times daily without everting the lids. As soon as three negative smears were obtained the patient was dismissed and given a mild solution of zinc and boric acid to be used at home several times daily, returning twice a week for four weeks. In treating ulcers of the cornea they generally used alcohol or tincture

of iodine and seldom the thermic cautery.

He thought it made little difference what was used. The important factors were to get the cases early, keep them clean, and handle the lids carefully during treatment. If this was done the majority of cases would recover without complications.

Dr. A. A. Hayden endorsed everything Dr. Allport had said. Dr. Agnew, of New York, a long time ago devised a fairly permanent solution of silver nitrat, containing to the ounce one dram of sweet spirits of niter, which kept the solution stable for a number of months. He believed it was not necessary to evert the lids if a lid elevator was used thru which the irrigation could be made. This elevator contained a canal with two or three openings in the margin of the end which was placed under the upper lid, and allowed free irrigation. The accumulation of pus could be decreased by frequently anointing the lids with a 1:5000 bichlorid solution. Specific instruction should be given in works on obstetrics not to irrigate the eye with salt solution before using the silver nitrat, as was often done.

In his opinion ice should not be applied for more than ten or fifteen minutes at a time, application being made as often as every two or three hours. The thing that gave most relief after the lids became enormously swollen was an early canthotomy. Nurses and doctors should use every possible preventive measure to avoid personal contamination. Large glasses should be worn in the treatment of these cases, as was done in various operations for pus tubes or other operations in which the gonococcus might be present, and the hands should be most carefully washed before and after the treatment.

Dr. Henry Mundt was convinced that education was a very important factor in the prevention of gonorrheal ophthalmia. Where education failed the fear of God placed in a man's heart might be of some value. He cited a case against a hospital in this city in which argyrol was used in place of silver nitrat in which the hospital and

physicians were assessed in the neighborhood of \$14,000. Men who formerly believed that a substitute for the Credé method could be used were now convinced that this should not be attempted. In a great many hospitals if physicians wanted anything else used it was necessary to give a written order to that effect, and most men would think twice before doing this. He agreed with Dr. Hayden that an external canthotomy was one of the most helpful things in preventing, also in the treatment of corneal ulcer.

Dr. John M. Lipson stated that in fifteen years' experience only one child had developed ophthalmia neonatorum. All of his cases were treated exactly alike by means of the Credé method and he did not understand why this child developed the disease, unless it was the only one in which the gonococcus was present. It was his opinion that the cases that did not develop the ophthalmia neonatorum did not have the gonococcus.

Dr. Thomas O. Edgar, Dixon, Illinois, reported an unusual case seen by him during the past year and a half. A two-months-old baby was brought for examination with a history of having what was presumed to be two per cent silver nitrat dropped into its eyes six or eight hours after birth by a practical nurse. The baby, previously quiet, cried severely during the night. About 4 A. M., eight hours after the use of the silver nitrat, the right eyelids began to bleed and continued to do so all that day, becoming much worse in the second evening, and, in spite of the employment by a second doctor, who had been summoned, of various means to stop the hemorrhage, including the use of cotton packed under the lid and the injection of some kind of serum into its leg, the bleeding ceased only after a grave loss of blood during the next twenty-four hours.

Three days later, the right eye bled again for several hours. During this time the eyelids of the right eye were much swollen. When first seen by Edgar at the age of two months the upper eyelid of the right eye was slightly congested and

showed a tendency to invert, while the cornea exhibited a central whitish opacification, superficial but also extending into the deeper layers. This area in its densest portion was approximately round in shape, about five millimeters in diameter and showed several pin point brownish areas, probably due to argyrol. The left cornea was clear. A bacteriologic smear from the conjunctival sac in each eye proved negative. The eyelashes for a definite portion of the border of the right upper lid extending eight millimeters temporalward from the center of the lid border continued during the next year, at times, especially when the baby cried, to rub the cornea and even caused a faint pannus in the upper peripheral portion.

The question of hemophiliac diathesis having arisen in this case, the test of the coagulation time and hemoglobin was more than once taken during its first year; and together with a general physical examination by a competent internist proved normal. There was no history of hemophilia in the family. When the child was fourteen months old the parents consented to a modified Hotz operation for the circumscribed entropion, with an excellent cosmetic and therapeutic result. When seen four months later, the cornea had become much clearer. According to the history as given it is not certain that there was any bleeding from the left eye; if present, it must have been insignificant; in explanation of which it is possible that none or little of the medicine was gotten into the second eye.

It was thought by some of the parties concerned that there was the possibility of an error in the strength of the silver nitrat. The pathogenesis is not, then, satisfactorily established. This case is not cited against the use of the Credé prophylaxis for ophthalmia neonatorum, but to show that, like any other procedure, it must be used correctly and with all due precaution.

Dr. Charles H. Long said that when in general work he had taken care of some 1,500 obstetric cases, and all of them were treated with a 1 per cent

solution of nitrat of silver. He never had a case of ophthalmia neonatorum. The cases of this disease which he saw were from the practice of midwives and he thought education among midwives should be brought about. Most of them knew nothing of antiseptics and were strangers to what should be done to prevent ophthalmia neonatorum. In his opinion it would be an excellent plan for health officers and medical societies to appoint one meeting a year to discuss this subject and invite midwives and nurses to be present. In this way much could be done toward educating them along this line. It seemed necessary to have midwives, for without them many cases would have no care at all.

Dr. Clarence Loeb stated that oculists objected to the licensing of optometrists because they did not possess sufficient skill and knowledge to do their work properly, and he believed the same thing should hold true of obstetricians and midwives. The profession of midwifery should not be tolerated in this day of charitable physicians and so many free dispensaries and hospitals. In many states it was obligatory to report all sore eyes of infants and then the health department saw that the cases were properly treated. The Credé method was all right as far as it went, but all cases should be reported with a statement of the kind of treatment used.

As to discussing the subject, this had been tried in Missouri a couple of years ago, but they had great difficulty in getting the members of the medical societies to provide a place for such discussions, and the meetings were not well attended. The profession and public were lukewarm. Those who did attend probably learned a great deal, but the majority of them forgot it very speedily. If proper pamphlets could be given to the women at the psychologic moment, shortly before the birth of the child, they would probably be impressed and insist upon proper treatment. In his opinion the best plan of education was to teach this subject in the medical schools in a more complete manner, including the prophylaxis.

This should be one of the questions on examination day and the men would know, at least at graduation, how to treat and how to prevent it.

Dr. Allport, in closing, said that in most of the laws which had been enacted in the different states it had been specifically stated that all cases of red eyes should be assumed to be ophthalmia neonatorum and so taken care of. His paper dealt with the prophylaxis and not the treatment of ophthalmia neonatorum, which was a large and entirely different subject. He did not wish to be understood as stating that the only thing to be done to prevent this disease was to use nitrat of silver. He believed that was at the present time the only drug to be used, but many other things should be taken into consideration, as shown in the leaflet which he had compiled for distribution.

Prevention begins before birth and the vagina should be properly cleansed so as to provide as clean a passage as possible for the child and other precautions taken. There are various reasons why nitrat of silver did not always prevent ophthalmia neonatorum. It must be properly used; in many cases where the treatment failed the solution did not reach the conjunctiva at all. The solution must be absolutely reliable. He did not know what produced the unfortunate results in the case reported by Dr. Edgar, but it was not due to the nitrat of silver if it was in proper condition when it was used. Dr. Nelson spoke of the late invasion of ophthalmia neonatorum, but in his opinion if this occurred more than three or four days after birth it was due to something that happened after birth and was not a true ophthalmia neonatorum.

As to midwives, Dr. Loeb thought they should be classed with optometrists and he sympathized with that. Theoretically midwives should be abolished; they are not competent to take care of children at birth, but children are being born at a great rate each year and the doctors are not able to take care of them all even if called, and poor people do not indulge in doctors very much, anyway. In his opinion it was not

practical to attempt to abolish them, and as a practical matter they must be educated and retained. The best way to get along with the subject is to try to make the midwives better and educate them as much as possible. With this object in view it might be a good plan to invite them to attend meetings at which this subject is discussed.

In the matter of education, legislation went a long way and was very helpful, but people in general must be educated to understand about these things. He was for a number of years general chairman of the Committee for the Prevention of Blindness in connection with the A. M. A. At that time they had local chairmen in every state in the Union except three, and there was an organization for the promulgation of knowledge concerning the conservation of vision. Meetings were held to educate the people about the care of their eyes and a series of twenty leaflets were published and distributed throughout the states; lectures were given to nearly 2,000,000 people and in the neighborhood of 200,000 pamphlets were given out. It was his opinion that this campaign did a great deal of good. It was too much to expect perfection, but we should keep hammering and hammering away and be satisfied with doing all the good we can.

Trachoma.

DR. CLARENCE LOEB stated that this disease had been endemic in Europe since antiquity, although it had been believed that it first appeared in Europe at the beginning of the nineteenth century. It was an interesting commentary on the improvement in prophylaxis and hygiene since that time to note the rarity of the disease in the armies engaged in the present war. With the possible exception of the negro, no race and no land is free from trachoma, but certain areas seem to be more infected with it than others.

In the United States it was especially prevalent among the Indians, in the mountains of Kentucky, and in the eastern centers of immigrant population. This wide dissemination of the disease was important for two reasons: first, because its destructive effect upon

the eyesight was daily adding to the quota of the blind of every nation; and, second, because its infectious character made even a single case a source of danger to the community in which it existed. It had been estimated that 9.4 per cent of all blindness was due to trachoma, and that this disease could be classed among the preventable causes of blindness.

It was a disease primarily of the conjunctiva, although its influence in causing blindness was exerted through the complications affecting the cornea. Its pathologic anatomy consists in numerous inflammatory infiltrations of the conjunctival tissue. These enlarge and form the "granulations" which are characteristic of the disease. These may be present as isolated follicles, more or less hidden by the hypertrophied conjunctiva which takes on a papillary character, or the follicles themselves may be so numerous as to be the predominant feature of the disease. Finally, there may be any stage of gradation between these two forms.

As to etiology, little could be definitely stated. The disease is highly contagious, but its transference is brought about only by actual contact of the nonaffected eye with some article contaminated by the secretions of the affected eye. While not contagious in the same sense as influenza and similar diseases, it is probably caused by some microorganism, the nature of which has not been satisfactorily settled.

The symptoms of trachoma vary with the stage of its development; in the beginning the patient may be very little inconvenienced or there may be fulminating symptoms. The cicatricial stage is marked by the appearance in the conjunctiva of fine, white lines, which increase in length and width, forming a network in whose interstices the remnants of conjunctiva appear as red islands. The amount of scar tissue depends on the age of the process, the severity of the disease and the lack of treatment or its improper character.

As the scar tissue contracts the cul-de-sacs are obliterated, adhesions between the ocular and palpebral conjunctiva develop and the whole conjunc-

tival sac shrinks, drawing the lids close together, limiting their movements and narrowing the palpebral orifice. Eventually the margins and lower parts of the lids will be curved inwards against the eyeball, a condition called entropion. The constant rubbing of the cornea by the eyelashes causes, subjectively, intense pain; and objectively abrasion of the corneal epithelium with opacification of the cornea from a traumatic keratitis, or the formation of ulcers. Whether the result of the trichiasis and entropion is corneal opacity or staphyloma, or both, the net result is the same—complete or almost complete loss of sight.

The treatment of trachoma consisted of three parts, prophylactic, medicinal and surgical, the first of which was the most important. The prevention and ultimate total eradication of this disease depended upon the ability to isolate the affected individual completely. Places where large numbers of people are in more or less intimate contact should be kept under medical inspection repeated at frequent intervals. As to medical treatment, each physician used the treatment which had proved most successful for him. One of the best remedies was a 1 per cent solution of silver nitrat, especially where there was profuse discharge or corneal ulcers.

Dr. Loeb found that the best results were obtained in all stages by the use of the copper sulphat pencil, applied to the upper fold of transmission once a day so long as any granulations were present. When these were gone it was replaced by 2 per cent zinc sulphat, one drop daily. Throughout the disease the eyes must be cleansed frequently with a saturated solution of boracic acid, which was applied with pledgets of cotton well moistened. If iritis or ulcers develop the use of atropin is indicated, together with smoked glasses, which are also of benefit where there is much photophobia.

In the surgical treatment, in the beginning of the disease some form of expression of the granulations is to be employed, followed by the usual medicinal treatment. In the cicatricial

stage the surgical treatment is to be directed against the effect of the trichiasis and entropion. Sometimes a simple canthoplasty is sufficient, but usually it is necessary either to move the lashes further away from the lid margin, or to create a new lid margin, or even to remove the tarsus. An optical iridectomy may be of service in cases of corneal opacities.

DISCUSSION.—Dr. H. W. Woodruff, Joliet, Illinois, believed that in the beginning of trachoma, when the typical granulations were present, there was a very definite indication for the operation of expression; and the results were so marked that there was no question about its value. After reaching the cicatricial stage with deformities of the lid there were certain definite conditions to deal with. The narrowed palpebral fissure was dealt with by canthotomy. The ingrown eyelashes were dealt with by the well known Hotz operation or by skin grafting or by marginal mucous grafts. The operation of tarsectomy he considered the greatest triumph of the surgery of trachoma.

The one characteristic feature of trachoma was its tendency to relapse. One theory was that pannus was due to the rubbing of the lid on the cornea and another that it was due to trachomatous disease on the cornea, but there was no question that the rubbing of the scar tissue of the lid was a very prominent factor and the operation of tarsectomy was indicated in these cases in which relapses occurred where there was not too great an atrophy of the conjunctiva of the cul-de-sac. The operation was so comparatively simple and the results so certain that it seemed as though anyone who had had experience with trachoma cases and their relapses would be a strong advocate for it. It was important that it be done with great care in order to preserve the muscular tissue; and nothing be removed except the tarsus and overlying conjunctiva. In removing the tarsus it was important that it be removed near the lid border as possible. At least near enough to take in the longitudinal scar which corre-

sponded to the sulcus subtarsalis, because that was the particular point where the deformity began and where there was nearly always a linear scar.

ALFRED N. MURRAY, M. D.,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

January 18, 1919.

DR. JOHN A. McCaw, Presiding.

Corneal and Uveal Tuberculosis.

W. C. BANE, Denver, again presented a case of corneal and uveal tuberculosis exhibited at the previous meeting of the society. At that meeting the tension of the patient's right eye was 54 mm. of mercury, and the tension subsequently increased to about 60 mm. of mercury. On December 31 a scleral puncture was made in the lower outer quadrant, and the tension fell to 20 mm. of mercury; but in three days had risen to 43 mm. of mercury, and in five days to 60 mm. There was also by this time severe pain in the eye. On January 11 sclerocorneal trephining was done, using the Fox flap. After a few hours the eye was comfortable, and there had been no return of pain. The tension was still subnormal; the vision at times of the hand as an object.

DISCUSSION.—J. A. Patterson, Colorado Springs, referred to a case of uveitis in which on account of increase of tension he had done two trephining, with temporary improvement each time, but permanent gain was apparently interfered with by a large store of whisky which was concealed in the patient's residence.

Edward Jackson, Denver, referred to a case of trephining in which the large cystoid scar of irregular shape persisted after the operation, the trephine opening being visible as a dark circle through the cyst.

D. H. Coover, Denver, who had done about an equal number of trephine operations with the Elliot flap and with the Fox flap, felt that with the Elliot flap one was much more likely to

get a cystoid cicatrix than with the heavier flap. He thought that the reason there were so many cases reported of infection after the Elliot operation was that the conjunctiva became so thin that there was more danger of germs penetrating than through the heavier flap. If this flap were seen several months later it would be very much thinner, but it would not be so thin as with the Elliot technic.

C. E. Walker, Denver, referring to the fact that in Dr. Bane's case the use of atropin had apparently greatly increased the tension before operation, suggested that in any case where atropin seemed to be indicated but its use involved some risk, it was better to use homatropin on account of the fact that the action of the latter was much briefer and much more easily controlled.

J. A. Patterson, Colorado Springs. It is often difficult to get sufficient dilatation with homatropin. I inject dionin, holocain, and a drop of the ordinary 4 per cent solution of atropin under the conjunctiva, with excellent results. The dionin greatly hastens complete action of the atropin.

E. R. Neeper, Colorado Springs. We have not sufficiently realized the value of cocain in these cases. I have had much better results from using cocain in conjunction with the mydriatics than where they were used by themselves. By this process adhesions break down much more rapidly. The cycloplegics all cause a relaxation of the circular muscles, whereas cocain contracts the straight muscle fibers.

W. H. Crisp, Denver, stated that he had on several occasions, with great advantage to the patient, changed from the use of eserine to that of atropin, after satisfactorily testing the patient's reaction to the use of homatropin.

J. A. Patterson, Colorado Springs. In the case of an eye struck by a ricocheted bullet, where the patient was uncomfortable under either atropin or eserine, the eye became quiet and comfortable under the use of a prescription containing a small amount of cocain a small amount of holocain, and some hyoscine.

Dr. Bane (closing). The opinion was freely expressed at the last meeting that trephining would be undesirable in my case; but the operation has so far proved beneficial and has not given rise to any trouble whatever.

Iridectomy for Glaucoma; Communicating Vein on Disc.

Edward Jackson, Denver, showed a man of 65 years upon both of whose eyes an iridectomy had been done for glaucoma by Dr. E. V. L. Brown of Chicago. Before the operation vision had been failing rapidly, and each disc was cupped 5 or 6 diopters. Now, eight months after the operation, the eyes were quiet, tension right 28 and left 20 mm., and vision was improving slightly (right vision of moving objects, left 2-100ths). In the left eye a communicating vein, as large as the superior and inferior branches, formed an irregular circle two-thirds the diameter of the disc, starting from the superior vein close to where it emerged, passing around the temporal side of the glaucoma cup, and ending in the inferior branch. It was quite tortuous, and seemed to give off no small branches in its course.

DISCUSSION.—W. H. Crisp, Denver, had seen this man several times before he went to Chicago for his operation, the last time being about two weeks before the operation. At the first visit, the tension had been right 45, left 55 mm.; which after two instillations of eserine 1 to 360 had fallen to right 32, left 42; the vision of the left eye at the same time rising from 2/15ths mostly to 5/8ths partly. The patient was irregular in his use of eserine and in his attendance at the office; and although warned that an operation would be necessary to save vision, insisted on postponing action. The last that was heard of him was that he was going to a Chicago surgeon at the expense of the Pullman Company, whose employee he was.

Optic Neuritis.

Dr. W. C. BANE again presented the case of neuroretinitis in a woman of 54 years which was exhibited at the previous meeting. The vision of the af-

fected left eye was on the previous occasion nil. Vision began to return in this eye on December 28, the first evidence being ability to see flashes of light. The vision was now 1/240th. The disc was slightly pale yet some of the nutrient vessels were present. The patient had been taking 1/30th of a grain of strychnin three times daily, and the high frequency current had been used about every third day.

DISCUSSION.—E. R. Neeper, Colorado Springs, suggested that if the disc had been growing whiter during the past month and the vision had at the same time shown improvement, further improvement was fairly likely.

D. H. Coover, Denver, recalled a case which he had exhibited some years previously, of a little Jewish girl who had a retrobulbar neuritis apparently due to ethmoid inflammation. Immediately after the ethmoids were opened and free bleeding began the vision started to improve. In this case the improvement of vision was coincident with whitening of the discs.

Edward Jackson, Denver. As a rule, in retrobulbar neuritis the disc is left somewhat white, and you cannot tell from the disc what the vision is. The majority of these cases show some whitening of the nerve head even with full vision.

Magnet Extraction of Steel.

WILLIAM F. MATSON, Denver, presented a man of 52 years whose left eye was penetrated on August 15, 1918, by a chip of steel from the drive rod of an engine. The fragment, 0.5 by 5 mm., passed through the cornea and iris midway between the pupil and the sclero-corneal margin. There was very slight hemorrhage in the anterior chamber and no opacity developed in the lens. The foreign body, which was shown by X-ray to lie on the floor of the eye in the vitreous, was removed through a scleral opening between the external and inferior recti muscles, by means of a small tip which was attached to Dr. C. E. Walker's giant magnet. With a plus 2.25 cylinder axis 30 degrees the patient had 20-20ths vision in this eye. The other eye had

been blind since boyhood from traumatic cataract. The eye was kept thoroughly under control with atropin for six weeks after the injury.

DISCUSSION.—C. E. Walker, Denver. The decision to enter through the sclera posterior to the ciliary region was due to the fact that there was no opacification of the lens. After separating a small flap of conjunctiva, the sclera was punctured with a Graefe knife. The small tips which can be applied to the giant magnet make it equally if not more efficient than the hand magnet.

W. C. Bane, Denver, referred to a recent case in which from the X-ray it was uncertain whether the foreign body was within the back of the eye or not, and the giant and hand magnets both failed to move the foreign body. But, it being necessary to enucleate the eye on account of extreme mutilation, the foreign body was found to be embedded in the sclera.

E. R. Neeper, Colorado Springs, had had several cases in which the eye had gone to the bad later, sometimes several years after the removal of a foreign body with seemingly perfect results. On the other hand, he recalled a case in which a piece of bottle glass had passed through the vitreous and made its exit at the temporal edge of the disc, and yet the eye had healed without incident, and vision was as good as that of the other eye.

F. E. Wallace, Pueblo, had seen a case in which a piece of steel was embedded just above the optic disc, but the outcome had justified a waiting policy. The danger zone of the eye had not been injured.

Proliferating Retinitis (?), Dating from Infancy.

Edward Jackson and C. O. Eigler, Denver, presented a case, in a girl aged 12 years, of fundus disturbance dating from infancy. Along the lower temporal vessels of the right eye there was a white area and nearby some small black pigment spots. Some white streaks connected the white area with the vessels. The principal area was perhaps in advance of the level of the

retina. The condition was apparently an old one, and the etiology was questionable. From the streaks on the vessels and the apparent connection of these with the white area, Dr. Jackson was disposed to think that it had originated in a hemorrhage, possibly a hemorrhage at birth. The fact that some of the streaks ran up to the disc suggested that the case might be reckoned as one of proliferating retinitis.

WM. H. CRISP,
Secretary.

OPHTHALMOLOGICAL SECTION.

Baltimore City Medical Society.

Meeting of January 22nd, 1919, held by invitation at General Hospital, No. 7, Evergreen Junior.

DR. J. W. DOWNEY, JR., Presiding.

In the absence of Colonel Bordley, Major Ardan gave a talk, briefly going into the history of the founding and development of the Hospital and School for the reeducation of the blind.

The patients after being admitted are given a physical examination by the different members of the staff to determine their suitability for hospital training, and are then put to school work. The course is divided into four periods of two months each.

When the patients enter they are, as a rule, very much depressed, and for the first period are given a large amount of entertainment and physical exercise in the recreation building, with a short period of manual training in weaving and other arts which develop their tactile sensation. An interesting fact is that those men who have been used to manual work, and therefore have thickened cuticle on their finger tips are more apt than those who have less hardened epidermis.

In the second period the hand work is continued, the recreation and entertainment is lessened with instruction in vocational training, which varies with the aptitude of the individual. The third period is arranged with still more vocational work and less amount

of entertainment and recreation, while the fourth period consists largely of specialized vocational work.

In this course the man is not alone taught how to use his hands, but is also taught how to conduct a business for himself, and, as a rule, a man's near relative, either sister, brother or fiancée is invited to the instructions and receives training along with the soldier: so that on leaving the school they will be in a position to support the scholar both morally and in a business way. The hand work being taught thruout the four periods.

Lieutenant Campbell showed several very interesting cases that had returned from the front; consisting of gas cases, cases for plastic work, simple chronic glaucoma in a boy of twenty-one, and a case of conical cornea; after which a tour of inspection was made of the buildings and the work accomplished.

Mr. Campbell, assistant director of the institution, then gave a very instructive discourse upon the advanced methods used in the teaching of the blind, after which the meeting adjourned.

C. A. CLAPP,
Secretary.

ABSTRACTS

Koster, W.—Removal of Small Foreign Bodies from the Anterior Chamber.—*Tidjdschr. v. Geneesk.* 1917, v. 1, p. 802.

Every ophthalmologist with experience will agree that the removal of foreign bodies from the anterior chamber is not easy. Even when the foreign body is of iron or steel, its removal may be difficult. The surgeon who does not proceed systematically may not succeed at all, and the eye be lost.

Bodies larger than 2 mg. of iron or steel give the least difficulty. One attempts removal with the giant magnet thru the opening in cornea or sclera, if the trauma is recent. In each case the presence and the location of the piece has been determined with the sideroscope. Mostly, however, the corneal wound is small and closed, so that the anterior chamber has reformed. The particle brought thru the pupil with the magnet, strikes the cornea, often against the closed wound, thru which it passes if presenting its shortest diameter. These are the easy cases.

It is not so easy, if the splinter is very fine and the wound already closed, as happens with very small corneal traumas. Then a new opening must be made at the periphery of the chamber, where the piece drops, when the magnet stops attracting it. The particle is entirely invisible, being behind the

limbus. One must now enter the anterior chamber, as peripherally as possible, where one knows the particle to be, with a fine Graefe knife directed radially, and then make an incision along the corneal margin, a little longer than the foreign body, or at least to 6 mm. With the pole of the hand magnet the scleral side of the wound is pressed slightly, when the foreign body presents itself.

The mistake mostly made is that the incision is too much in the cornea, or that the opening is made with the triangular keratome, at the place where the particle is. The piece of metal lies then in the chamber angle, behind the scleral wound lip, and is held by the iris tissue as soon as the aqueous has escaped. And even a strong magnet is incapable, with the pole in the wound, to extract it, as it becomes pressed in the iris tissue. If one tries to move the particle the next day, when the chamber has reformed, one will not succeed as exudate will fix it in the root of the iris.

If Koster has to treat failed extractions, he locates the splinter with the sideroscope as accurately as possible; and at that spot he makes a scleral angular incision with one line in the limbus and the other radial in the sclera. The chamber angle, with the root of the iris and ciliary body is then ex-

posed, the point of the flap is pulled outward with a fine sharp hook, and the giant magnet brings forward the particle. One incision along the limbus is insufficient. The flap is replaced with a superficial suture.

Too little attention is paid to the minuteness of the attractive force of the strongest magnet on the very small particles. When the anterior chamber is absent they are easily retained by folds of iris. It is not advisable with a very fine splinter kept against the back of the cornea by the magnet, to perforate the cornea at that place with a bistoury, which the magnet does not attract. These knives are never very sharp; and those small splinters move so often in the anterior chamber that they can be at another place, when the paracentesis has been done. They cannot then be moved and one must wait some hours until the chamber is restored.

Nonmagnetic bodies are mostly lead shot, or pieces of copper, more rarely pieces of glass and stone, a few times pieces of reed or wood. The Roentgenogram is of the first importance for the diagnosis of lead or copper in the chamber angle. Pieces of glass remain mostly in the neighborhood of the cornea, penetrating or hung on it. Thru explosion of glass vessels glass can go deep in the eye. If a piece of the glass is at hand it should be examined for its penetration by Roentgen rays. A glass splinter in the anterior chamber is often seen better than expected thru the totally reflecting borders at the planes of fractures.

One should not try to remove such foreign bodies thru a straight line wounds, and no surgical forceps should be used. A good access must be made toward the foreign body by lengthening if necessary, the wound opening, so that a flap is formed, which can be lifted with a sharp hook. It is preferable to make in the cornea a fresh incision at right angles, with a Graefe knife alone or with a pair of blunt, strong scissors. If necessary a third incision is made, so that a square flap is formed, the base of which is made, if possible, toward the limbus. If the

foreign body is thus well exposed it should be grasped with a strong anatomic forceps. One or two fine superficial silk sutures may be used, or, if necessary, cover with a conjunctival flap.

In an eye, where the original wound has well closed, the keratome can be used sometimes, but with the narrow knife the chance is greater for the incision to be perpendicular thru the cornea, which gives more room, and a contact can be more easily prevented with the knife than with the keratome. For foreign bodies in the chamber angle first a radial incision next the object is made, as peripherally as possible, with the sharp edge of the knife outward; and the cut along the limbus with blunt scissors in the direction of the body. Or one plunges the knife first at one side of the object peripherally in the limbus, goes around first at one side of the object and comes out at its other side again thru the limbus. After an incision is thus made thru the limbus, one makes with scissors at one or both ends radial incisions in the cornea, and lifts this flap firmly with a sharp hook. The hemorrhage is here of no consequence. If, however, one enters with iris forceps thru a keratome incision, and while the iris lies against the cornea, wishes to grasp with surgical teeth a hooky or globe-like object, a hemorrhage will start and obscure sight of the object. If one keeps on trying, the foreign body moves the deeper.

Koster describes a case where, after a failure in extraction, he succeeded. Enucleations should not be hastily resorted to. Thru explosion a piece of glass entered the anterior chamber, lying at the temporal side of the iris. The glass was partly in the pupillary space. The next morning the piece was below in the anterior chamber. The ophthalmologist made an incision below with the keratome, and tried to grasp the glass with iris forceps. Hemorrhage started, and after some vain trials the foreign body could not be seen. Two days later the patient came under Koster's care. There was still some blood there, and the pupil was

filled with opaque lens substance. However, a parallelogram-shaped piece of glass, probably 3 to 5 mm., was seen lying in the pupillary space, with tension a little too low.

Next morning, at the upper margin of the pupil, somewhat to the nasal side, an incision 8 mm. long was made perpendicularly thru the cornea, with a very fine Graefe knife. With curved tenotomy scissors a second incision 6 mm. long was made toward the nose downward in the cornea perpendicular to the first. The angle of these two was lifted with a very fine sharp hook; the lens substance with the foreign body and also a bead of vitreous pushed a little into the opening. Koster was able to grasp the piece of glass with strong, fine anatomic forceps. Lens substance was partly removed. The wound closed well. No sutures in the cornea. Conjunctiva a little loosened nasally and upward, and after pushing it over the end of the corneal wound it was sutured. Slight compressive bandage and bed rest. Two years later the eye can be corrected to vision of nearly 6/6.

E. E. B.

Stephenson, Sydney.—Orbital Suppuration from Acute Anterior Ethmoiditis in Young Subjects. (*British Journal of Ophthalmology*, Aug. 1918, p. 416.)

The writer has found the form of orbital suppuration described in this communication tolerably common in young children, altho the essential nature of the condition is not always recognized. It is not rare to see a young child suffering from general malaise with swelling of the lids of one eye, which is more or less prominent, in which orbital suppuration is unrecognized. Many of the milder cases get well under simple treatment, or without treatment, with or without a discharge of pus from the nostrils, or into the nasopharynx.

But a certain number of the cases return later with signs of so-called "orbital cellulitis" or "orbital suppuration"; presenting tenderness, edema, redness, chemosis, protrusion, downward or downward and outward, and

impaired motility of the eyeball, together with general symptoms such as malaise, elevation of temperature, headache and vomiting. The condition is always unilateral, and there is an absence of history of coryza.

Stephenson is convinced, from his clinical observations, that these cases deserve to be classed as a separate entity, and that they are explained by an acute inflammation of the anterior ethmoidal cells (in severe cases inflammation of the posterior ethmoidal cells can not be excluded). The condition is not accompanied by any ophthalmoscopic signs, is not followed by optic nerve atrophy; and these patients do not die from intracranial complications.

Many get well under the simplest treatment—a cathartic, and locally a continuous dressing of six per cent alcohol or hot applications of boric acid. When symptoms are severe, or the general condition of the patient is threatening, surgical measures must be adopted.

The usual procedure is to make an incision into the orbit over any spot which seems to indicate the presence of underlying pus. If nothing escapes, the dressing forceps, with closed blades, are introduced into the depths of the wound, and the blades of the instruments are then separated more or less widely. In some instances of this operative procedure there is no escape of pus until two or three days later.

Several experiences of this sort led the writer to adopt a somewhat different procedure. Under general anesthesia, a curved incision down to the bone was made over the inner angle of the orbit extending from the root of the nose to the inner end of the eyebrow; a small raspatory was then introduced beneath the periosteum over the region of the anterior ethmoidal cells and pus usually escaped. Or, if the simpler orbital incision is preferred, in the absence of distant indications to the contrary, it is advised that the opening be made over the region of the anterior ethmoidal cells. The paper concludes with details of ten cases selected from a larger number.

C. H. M.

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DISEASES OF THE EYE DURING THE CIVIL WAR.

As the time has arrived for collecting material for and the actual writing of the Medical and Surgical History of American participation in the Great War, it is of interest to ophthalmologists to inquire into the subject of ocular affections as they drew the attention of military surgeons during our Civil War. Practically the only record is that preserved in the third medical volume of the impressive Medical and Surgical History dealing with the medico-military activities of 1861-1865.

The section "Diseases of the Eye" was made a separate order of "Local Diseases, Order II," instead of being included with "Diseases of the Nervous System," as was done by Farr, the British statistician.

In this classification were included amaurosis; cataract; inflammation of the iris; night blindness; ophthalmia; inflammation of the retina; other diseases of this order; inflammation of the conjunctiva; not a very elaborate or distinctive list, surely, but one, nevertheless, that mirrored ophthalmic knowledge (or the lack of it) in the early sixties.

In Medical Volume III, p. 849, we are told, under "Ophthalmia," the inflammations of the eye were reported prior to January 30, 1862, under the headings *Ophthalmia* and *Iritis*; subsequent to that date the term *Conjunctivitis* was substituted for the former.

During the five and one-sixth years covered by the medico-military service, 8,904 cases of ophthalmia and 65,739 of conjunctivitis were reported among white troops, making a total of 74,643 cases. Included among these were probably many cases of corneal infection, as 1,463 cases—1.96 per cent. of the whole number, or one out of every fifty-one cases—were discharged as unfit for military service; the average annual sick-rate being 33.4 cases per thousand men.

These inflammations of the eye were somewhat less frequent among the colored troops, the whole number having amounted to 5,153 cases, or to an average annual rate of 28.1 per thousand. This exceptional infrequency of disease among colored troops is explained by two considerations: "ophthalmia" was not occasioned in a notable degree by the ordinary exposures to cold and wet incident to camp life and active service; but was the

result of special causative conditions existing in certain localities, perhaps trachoma, of which the negro is wonderfully free. Moreover, these localities were held by a larger proportion of white than of black troops.

Ophthalmia prevailed to a much greater extent among the troops serving on the Gulf Coast than among those operating against Richmond. During the year ending June 30, 1865, 1,198 cases of conjunctivitis were reported among the 80,982 white troops constituting the Army of the Potomac, while 2,158 cases are said to have occurred among the 45,629 white soldiers serving in the Department of the Gulf. The prevalence in the latter area was attributed to sun-glare, to dust and to sandy particles in the air of stations on the coast line. Colored troops operated in this department, but the majority of those that contributed to the statistics held the line of the Mississippi River and were protected from the exposure to which the ophthalmia was attributed.

The record further shows that during the four years, July 1, 1861, to June 30, 1865, the average annual rate of prevalence of ophthalmia among white troops was, in the Army of the Potomac, 17.5 per thousand strength, in the Department of the Gulf 37.0, in the Department of New Mexico 47.5, and in the Department of the Northwest 85.0—the rate for the whole army having been, as already stated, 33.4 per thousand. In the northwest the glare from snow was regarded as an etiologic factor, taking the place of the sand-glare of other regions.

It was also contended that the persistence of ophthalmia in individual cases occasionally depended on a rheumatic or a syphilitic taint. Its prevalence or persistence in a command was sometimes ascribed to influences affecting the constitution. These were generally malarial; and as proof it was noted that some of the worse cases were cured in a short time after resorting to quinin. Eye inflammations that prevailed in two Ohio regiments were attributed to the existence of the scorbutic taint.

No specific mention was made of trachoma, nor of any form of contagious conjunctivitis, as such.

It is easy to point out that the Civil War History furnished the most meager and insufficient accounts of those ophthalmic diseases that prevailed during the war period, and in view of the probability that they did not much differ from those encountered by medical officers during the present war, is additional evidence of the ineffectiveness of the service from the ophthalmic standpoint.

On the other hand, when one considers that modern ophthalmic surgery was then only in its infancy, that definite information regarding the eye diseases was not accessible or nonexistent, the explanation is easy. Let us hope that the History now in preparation will deal completely with all the phases of military ophthalmology and compare favorably with the reports on the other branches of war medicine and surgery.

C. A. W.

A WORLD CONGRESS OF OPHTHALMOLOGY.

When war was forced on Europe in August, 1914, it immediately destroyed any possibility of the Twelfth International Ophthalmological Congress which was arranged to meet in "St. Petersburg" on the 14th of that month. Some of the papers to be presented to the Congress were already printed, and American Ophthalmologists, some of whom had already entered Russia and other countries that were first precipitated into war, will remember their experiences in escaping from the war zone as among the most strenuous and alarming of their lives.

The world has traveled far since 1914; new nations and new issues have risen, and the dream of permanent peace has drawn to the study of its problems the rulers, diplomats, and even the military authorities of the world. In the future international channels of communication and international gatherings must assume an importance greater than they ever had before; and among these channels of communication scientific journals and scientific congresses should show a most striking development.

It will be ten years in April since the Eleventh International Ophthalmological Congress met in Naples. Fully another

year must elapse before the arrangements for another such gathering can be completed. It is high time that a movement looking to preparation for it should be started. At the Naples meeting the United States was the chief rival of Russia as a claimant for the privilege of entertaining the Ophthalmologists of the world; and now Russia is impossible for such a gathering and must be so for years to come.

In the welter of world war, revolution and anarchy, the members of the local committee who organized for the Twelfth International Congress have disappeared, probably many of them are dead.

The initiative for a new gathering must come from a new source. Because of the terrific strain to which the leading civilizations of Europe have been subjected, the United States of America is by far the best place for the assembling and entertaining of such a Congress in the early future. We suggest that at the national meetings to be held in Atlantic City in June the necessary committees be formed to extend the invitation for such a Congress.

Some one of the Eastern cities that has been proved a good meeting place for our national medical organizations should be chosen for the holding of the Congress. It is nearer than London or Paris, not only for the United States, Canada, the West Indies, and Latin America, but also for Australia, Asia, and Japan; and equally near for South Africa.

When the Tenth International Ophthalmological Congress met in Lucerne, the majority of those who were contributing to the science and literature of ophthalmology lived within five hundred miles of that place; and few beyond a thousand miles except in the Eastern United States. Now, with important centers of scientific activity in Argentina, Egypt, India, Australia, and Japan, we have a whole round world to consider in choosing a meeting place. On the surface of

a sphere one point is as near the center as another.

In planning for such a World Congress, certain departures should be made from the plans that have been followed in the past. In the first place, the Congress should meet once in three years. But few would attend each successive Congress although there have been American ophthalmologists who planned to spend each summer vacation in Europe. The majority of those attending any particular meeting will be residents of the quarter of the globe in which it is held.

The Congress will not reach its full usefulness and development unless the opportunity for such attendance is afforded the ophthalmic workers in all quarters of the globe. If the opportunity is to come once in ten years to North Americans, or once in twenty years to India or Australia, meetings must be held more frequently. The few who travel widely will want at least a few opportunities to visit remote portions of the globe.

In a series of gatherings each composed largely of a different personnel, there is need for a more permanent executive body or organization. This must almost of necessity be based on the different national organizations of Ophthalmologists. Representatives from each of these can constitute the business commission of the Congress; by which the local committees for arrangements can be named and the publication of the transactions and such matters provided for.

Such a Congress, working along broad lines, can do much to secure a general hearing for scientific observations relating to ophthalmology wherever these be made. Its influence would be felt not only thru its own transactions; but still more thru a more general acquaintance with the persons and publications concerned with ophthalmic science and art thruout the world.

E. J.

BOOK NOTICES.

MIRRORS, PRISMS, AND LENSES.

A Text-book of Geometrical Optics. By **James P. C. Southall**, Associate Professor of Physics, Columbia University, New York. 8vo, 600 pages, 247 illustrations. New York. The Macmillan Co.

For the ophthalmologist who seeks a really broad educational foundation in optics, this work will be of interest and value. Thoro fundamental training in optics is too often neglected in preparation for ophthalmic practice; and the text-books that would help to give it, published in English, have been few and not always well written. Even for the student of ophthalmology who may never master it; a careful inspection of what this book contains will furnish a broader view of what the optical study for his specialty should imply.

The work is divided into fifteen chapters, and the reading of the headings of these gives an idea of the extent of the subject. They are: Lights and Shadows; Reflection of Light; Plane Mirrors; Refraction of Light; Refraction at a Plane Surface and also thru a Plate with Plane Parallel Faces; Refraction thru a Prism; Reflection and Refraction of Paraxial Rays at a Spherical Surface; Refraction of Paraxial Rays thru an Infinitely Thin Lens; Change of Curvature of the Wave-front in Reflection and Refraction. Dioptry System; Astigmatic Lenses; Geometrical Theory of the Symmetrical Optical Instrument; Compound Systems. Thick Lenses and Combinations of Lenses and Mirrors; Aperture and Field of Optical System; Optical System of the Eye. Magnifying Power of Optical Instruments; Dispersion and Achromatism, and Rays of Finite Slope; Spherical Aberration, Astigmatism of Oblique Bundles, etc.

The reflection of light which takes up the second chapter is mathematically simple as compared with refraction; and forms an excellent introduction to the more complex phenomena of the latter. It is too much neglected in works written for medical students and practitioners. The chapter and sections here devoted to it, could be read with interest by one

who knows little of elementary mathematics.

With regard to the chapters on refraction it is different. Altho this work by its large number of diagrams properly emphasizes the geometric side of optics, there are many algebraic formulas in it, the development of which requires close study even from one who has made himself familiar with the symbols used, and sets himself carefully and seriously to working out these formulas.

A notable feature are the problems appended to each chapter. By these the reader or student, who takes up the study without an instructor, can test his progress, or the thoroness of his grasp of the principles and methods he is studying. Some of these problems have quite a practical bearing on ophthalmic optics.

For the teacher of advanced optics, or the writer who wishes to get a broad view of this subject, this book will be highly valued as a book of reference. It appears to have been carefully prepared and proof-read for the elimination of errors. The diagrams are well proportioned and for the most part clearly lettered. It will be found the more suggestive because it is written from a point of view different from that of the practicing ophthalmologist.

E. J.

TEXT-BOOK OF OPHTHALMOLOGY.

By **Ernest Fuchs** and **Alexander Duane**. Fifth Edition. Octavo. 1067 pages, with 462 illustrations. Philadelphia and London. J. B. Lippincott Co.

The American Edition of Fuch's monumental work is described by Alexander Duane, the American editor, as "In several senses a new work." Yes, we may say it is a new work, and it may be perhaps permitted to say that the modesty of the American editor has been somewhat stretched in calling himself the translator. Really the work has been written by Fuchs and Duane, the former furnishing the skeleton and the latter the body and the habiliments. Some of the subjects have been so elaborated, or the manner of discussion has been so changed, that it were difficult indeed to ascribe the ideas to the Viennese author.

This fifth edition is very little like those which have appeared in the German language; if it were not for the old familiar illustrations it would be hard to recognize this as Fuch's text-book, then too, the illustrations have been amplified. Recent changes from the former American editions are in particular the chapters of Glaucoma, The Retina, Disturbances of Motility, and the sections on Refraction and Operations. Many of the newer methods, descriptions and even theories are included in this fifth edition, "Largely made on the editor's own responsibility."

The familiar appeal to the general practitioner in the preface is hardly applicable. Neither this nor any of the editions of the work were ever quite adapted to the common variety of doctor, or even to the beginner in ophthalmology. This is a book that is of primary use to the practicing ophthalmologist, and to him largely as a store house of information. The beginner would be appalled by the vastness of the subject and even by the size of the book, which now reaches one thousand and sixty-seven pages. He should first read text-books of less pretensions.

The reviewer's advice to the progressive oculist is, to buy this edition and shelve the older ones. H. V. W.

TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY. Volume 16. Fifty-fourth Annual Meeting, 1918. 8vo, 412 pages, 23 ils., 1 col. plate, 19 other plates. Published by the Society, Thomas B. Holloway, Secretary, Philadelphia.

This volume contains the papers, discussions, and proceedings of the last annual meeting of the society, with sketches of two of its deceased members; and the candidates' theses of the nine associate members elected at the annual meeting.

The latter occupy over 160 pages; and add greatly to the scientific value of the volume. They abundantly justify the practice of requiring candidates to show their ability to contribute to the proceedings of the society. The requirement that they should do so has stimulated the production of some valuable papers. Some

of these have already been published in this journal; and others will be brought before our readers in subsequent issues.

The volume is better illustrated than its predecessors. There are 23 cuts and diagrams in the text, and 19 insert plates and one in colors. The introduction of illustrations adds substantially to the value of almost any clinical report. It is a poor picture, indeed, that does not tell more about a clinical case than the text that would occupy an equal space. But there is as much to be learned of expression thru pictures, as of expression thru phrases and sentences.

Again the reader is urged to have these transactions in his library if possible. The early volumes may not be obtainable, but the current volumes can readily be procured thru the Secretary of the Society. E. J.

CORRESPONDENCE.

MUSCLE OPERATIONS.

To the Editor:—

Allow me to send you a few reflections suggested by the two letters dealing with operations for squint, in the November number of the *AMERICAN JOURNAL OF OPHTHALMOLOGY*, pp. 806-807.

A discussion between two medical men is never a disagreement between two persons, but between two opinions; a third person may therefore intervene, especially if he hopes to demonstrate that the divergence originates merely in an insufficient precision of the words used, and that the two colleagues are not speaking exactly of the same thing.

In the present case the word that lacks precision is "operation." If Dr. Loeb had written: "The position that all cases of convergent strabismus should be *tenotomised* is not a tenable one," I am certain that Dr. O'Connor would have been entirely satisfied. He might perhaps even have emphasized on the sentence, saying—as I say myself, after such personal experience I may have gained, and especially after all I have seen of my father's work for so many years—"The position that hardly any case of convergent strabismus should be *tenotomised*, is the only tenable." If, on the contrary, Dr. Loeb was speaking of advancement,

our two colleagues agree again, since Dr. O'Connor writes: "Few of us who operate, do so until we have eliminated the cases that are cured by glasses and visual training."

In fact, I doubt that this latter was the meaning of the word operation in Dr. Loeb's mind, for he would not have said that some operations result in strabismus of the opposite character, this being an inconvenience special to tenotomy.

Dr. Loeb advocates the nonoperative treatment, which gives him 40% correct positions of the eyes: the percentage is very good and does much credit to the author's skill and patience. He will, however, admit that the difficulty increases with the degree of the squint and the amblyopia of the deviated eye. Again, the amblyopia gets worse as time passes away, and the contractility of the externi gets weaker and weaker; this is a fact well known to any one who takes the trouble of measuring the excursion of the eyes.

If, then, a method—be it an operative one—enables us to reduce considerably the angle of squint, and, on the other hand, if by increasing the power of the externi, without impairing the strength of the interni, it gives the eyes a far better mobility, without any risk of divergent squint, there is no doubt that in the hands of so skillful an orthoptist as Dr. Loeb, such a method may give a still better percentage of correct positions. It may additionally enable to secure binocular vision, even if that has not been asked for, and, with the patient satisfy also the oculist.

The muscular advancement is the method I mean. With all its advantages it may be performed on very young children, when the amblyopia is not inveterate and the chances of subsequently restoring binocular vision are the very best possible.

Of course, there is no question of operating all cases before having thoroughly tried the nonoperative treatment; in case of failure it is the best preparation to the postoperative training of the binocular vision.

In short, I believe that if in the pending discussion the word operation means tenotomy, Dr. O'Connor will agree with

Dr. Loeb, and if it means advancement, Dr. Loeb cannot but agree with Dr. O'Connor.

Begging both our colleagues pardon for my intervention—our readers for my hesitating English—I am,

Respectfully yours,

DR. MARC LANDOLT.

Paris, France.

OPHTHALMIC JURISPRUDENCE.

By THOMAS HALL SHASTID, M.D., LL.B.

SUPERIOR, WIS.

Recent Law Decisions of Special Interest to Ophthalmologists.

PEOPLE V. GRIFFITH. (Supreme Court of Illinois, June 21, 1917, 117 N. W., 195.) A. B. Griffith, convicted in the Municipal Court of Chicago of practicing optometry without a license, brought the record by writ of error to the Supreme Court. The essential question involved was whether or not the Optometry Act of Illinois was valid, i. e., constitutional. *Held:* It was not. The judgment was therefore reversed. Reasons: (1) The act exempted from examination those who had practiced three years, entirely regardless of moral character, temperate habits, age, skill, knowledge, or competency to practice optometry. (2) It prescribed no subjects for examination.

The importance of this decision is very great.

MARTIN V. COMMONWEALTH. (Supreme Court of Appeals of Virginia, Sept. 20, 1917, 93 S. E. 623.) J. Harry Martin, convicted of practicing medicine in the City of Roanoke, Va., without first having procured a certificate from the Board of Medical Examiners of Virginia, brought a writ of error to the Supreme Court of Appeals of Virginia. Dr. Martin was a nonitinerant optician, who displayed on the front door and window of his place of business the following legends, "Dr. J. Harry Martin, Incorporated, Eyes Exclusively" and "Dr. J. Harry Martin, Incorporated, Optometrist." The conviction was had on section 12 of the Medical Practice Act of Virginia, which runs as follows: "Any person shall be regarded as practicing medicine within the meaning of this act

. . . who shall use in connection with his name the words or letters 'Dr.,' 'Doctor,' 'Professor,' 'M. D.,' or 'Healer,' etc. But the judgment was reversed on the strength of section 11 of the same act, which exempts "any noniterant person or manufacturer who mechanically fits or sells lenses, artificial eyes . . . or is engaged in the mechanical examination of eyes for the purpose of adjusting spectacles, eye-glasses or lenses."

ROUTT V. BROTHERHOOD OF RAILROAD TRAINMEN. (Supreme Court of Nebraska, Nov. 3, 1917; 165 N. W., 141.) The plaintiff sued the Brotherhood in the District Court of Douglas Co., Nebraska, on a benefit certificate held in the defendant company, Rule 68 of the company having provided that "Any beneficiary member in good standing who shall . . . suffer the complete and permanent loss of sight of both eyes, shall be considered totally and permanently disabled and shall thereby be entitled to receive . . . the full amount of his beneficiary certificate." The plaintiff had become unable to distinguish the colors red and green. The vision for no other color was affected, and the visual acuity remained substantially unchanged. Judgment below was given for plaintiff, and defendant company appealed to the Supreme Court. There the judgment was affirmed, the court declaring that "Complete and permanent loss of the sight of both eyes means loss of the use of the sight of both eyes for the purposes of the insured's avocation."

The opinion is plainly in accordance with prior law (e. g., *Kan. v. C. B. & Q. Ry. Co.*, 90 Neb., 1112, *v. B. R. T.*, 75 Neb. 183, and of *Sneck v. Traveller's Insurance Co.*, 88 Hun, 94) but a strong dissenting opinion appears in this case.

FRING V. PIERCE-ARROW MOTOR CAR CO. (169 N. Y. Supp., 309.) *Held*, in this case, that the loss of the lens of an eye is not the "loss of an eye." True the loss of coordination of the two images prevents the simultaneous employment of both eyes, but, still, the injured eye would be a reserve of sight in case of an accident to, or the destruction of, the other eye. [Cf. Magnus and Wurdemann's "Visual Economics," Wurdemann's "In-

juries of the Eye," and "Legal Relations of Ophthalmology" in "Am. Enc. of Oph.," p. 7042.]

BEARDSLEY V. EWING ET AL. (Supreme Court of North Dakota, Aug. 10, 1918, 168 N. W., 791.) From the viewpoint of a physician, one of the most important cases ever decided in this country. In fact no doctor, either general practitioner or specialist, can read this newly decided case without a feeling of intense dismay.

The facts are as follows: The plaintiff, a railway engineer, got a cinder in one of his eyes on Dec. 19, 1914. After various ineffectual attempts to remove the cinder himself, he went on the following morning (Dec. 20) to the offices of the defendants. There the cinder was removed. No bandage was applied, but the plaintiff was offered a prescription for a solution of boric acid—which, however, he refused. On Dec. 21, this time with a very painful eye, he went once more to the offices of the Drs. Ewing. On this occasion a bandage was applied, and a prescription was given for an argyrol solution. On the day following, Dec. 22, the plaintiff appeared once more at the offices of the defendants, this time with a well developed ulcer, and then (only two days after his first appearance in these offices) was referred to the head eye surgeon of the Soo Ry. Co. in Minneapolis, Dr. George E. Benson. An operation was performed by Dr. Benson, the eye was saved but the sight was lost.

At the trial, eight expert medical witnesses declared, under oath as a matter of course, that the treatment of the eye, as given by the Drs. Ewing, was absolutely all that could be desired. As far as the official records show, there was little or nothing in the testimony of Dr. Benson, who had been subpoenaed by the plaintiff, on which a judgment for the plaintiff could rationally be based. Moreover, the plaintiff and his wife were permitted to testify "to the size of the abscess on the eye on the 22nd of December. Certain improper questions were also asked of one of the defendants, on cross-examination, as follows: (1) Whether or not said defendant was insured against loss in malpractice cases, (2) whether or

not his brother, the other defendant in the case, was similarly insured. A witness, Dr. Grogan, was also asked (1) whether or not his expenses were met by the Northwestern Medical Association, (2) whether or not counsel for defendants were employed by the Northwestern Medical Association. An alleged improper suggestion was "made by plaintiff's wherein he said that 'the manner in which these physicians stand together is disgraceful.'"

Judgment was given for the plaintiff in the sum of \$7,933.50.

Defendants appealed to the Supreme Court, which, however, sustained the judgment, holding (1) a question of negligence is one of fact for the determination of the jury, (2) a layman is competent to testify to the size of an abscess which can be observed with the naked eye. [The fact that a layman would not know an abscess from a bit of tenacious mucus is not adverted to. A layman would, in fact not know whether an abscess of one size or another was or was not present.] (3) The improper ques-

tions asked and improper suggestions made by the counsel for the plaintiff, are not reversible errors.

Once more the writer can only observe that any doctor, whether a general practitioner or a specialist in ophthalmology, can only read the decision in the case of *Beardsley v. Ewing et al.* with consternation and dismay. Howsoever right the treatment by a given doctor in a given case may be, and howsoever numerous and trustworthy may be the expert witnesses who testify in his behalf, and howsoever slight the testimony may be which is given against his treatment, the doctor, as it seems, may yet be mulcted in heavy damages. There is, however, a single dissenting opinion in this report, that of Justice Robinson, which exhibits a perfect comprehension of the case in its medical, as well as its legal, aspects. The justice, at the close of his opinion, in fact declared: "Clearly the judgment should be reversed, and the action dismissed, because from the record it appears that there can be no evidence to sustain a verdict for the plaintiff."

NEWS ITEMS

DEATHS.

Dr. Clarence John Blake, Boston, aged seventy-five, died at his home, January 29th. Dr. Blake was so close to the ophthalmologist by virtue of his allied specialty that we note with deep regret that he has passed away.

Dr. Thomas Buzzard, of London, died January 1st, aged 88 years.

Dr. William F. Mittendorf, who began the practice of ophthalmology in New York City more than thirty years ago, died on February 14th, 1919, in his seventy-fourth year, and was buried in Sleepy Hollow Cemetery at Tarrytown.

Dr. Richard A. Reeve, Professor of Ophthalmology and Dean of the Medical Faculty of the University of Toronto, and Ex-President of the British Medical Association, died suddenly in Toronto, Canada, on January 27th, aged 77 years.

Dr. Abraham Sachs, of San Antonio, Texas, died January 19th.

MILITARY.

Capt. H. K. Fleckenstein, of Baltimore, is now at the head of the service at Camp Meade.

Capt. Charles P. Small, of Chicago, has been sent to take charge of the Post Hospital at the Rock Island, Illinois, Arsenal, U. S. Army.

Lieut.-Col. Greenwood and Lieut.-Col. Derby have just returned from long service overseas. It is reported that they will both soon be discharged from service.

Major A. C. Magruder and Capt. E. M. Marbourg of Colorado Springs have been honorably discharged from the service and have resumed their practices at home. Major Magruder saw almost eighteen months of service, a large part of which was as Commanding Officer of the base hospital at Fort Sill.

Lieut.-Col. George E. de Schweinitz of Philadelphia presided at a recent meeting, which was held in the American Academy of Music, upon which occasion Sir Arthur Pearson of St. Dunstan's, London, made a most illuminating address upon the education of the blind soldier. Col. de Schweinitz preceded the address by some appropriate reference to Sir Arthur's work, based upon his recent visit to St. Dunstan's.

Lieut.-Col. Casey A. Wood is spending a few months at Stanford University, California. No

doubt he is working up something that he will give us later on. He has recently addressed the "Twilight Club" of Pasadena on "Problems Connected with the Reconstruction of Disabled Soldiers."

George E. de Schweinitz, Lieut.-Col. M. C., U. S. A., Philadelphia, has been appointed general consultant in ophthalmic surgery to the Surgeon General of the Army; Col. Vilray Blair, consultant in oral and plastic surgery; Lieut.-Col. H. P. Mosher, consultant in otolaryngology, and Major Charles H. Frazier, consultant in neurosurgery.

Honorable discharge from service in the U. S. Army has been granted to Doctors A. L. Benedict, of Buffalo, T. A. Woodruff, of Chicago, H. W. Loeb, of St. Louis, J. O. McReynolds, of Dallas, Texas, W. B. Lancaster, of Boston, Mass., E. S. Sherman, Newark, N. J.

Capt. A. B. Middleton, M. C., of Pontiac, Ill., who has had charge of the Base Hospital Eye Dept., and served as Oculist for the Special Medical Board for the past year at Camp Travis, Texas, was discharged, and returned home March first.

Sir Arthur Pearson, the blind founder and director of St. Dunstan's Hotel for Blinded Soldiers, London, addressed a mass meeting at the Century Theater in New York City on February 4th. He described his work in restoring blinded British soldiers to self-support. Lieut.-Col. James Bordley, who is in charge of work for blinded American Soldiers and Sailors, and Director of the Red Cross Institute for the Blind, told of the work being done at Evergreen, Baltimore, for the men of the American Expeditionary Force who lost their sight in action.

PERSONAL.

Dr. John A. Donovan has been elected President of the Chamber of Commerce of Butte, Montana.

Dr. Daniel W. White, of Tulsa, Oklahoma, was married on the 19th of February to Miss Connor Trotter, of Kansas City.

Dr. R. L. Randolph, of Baltimore, Md., has resumed his practice after a month's needed rest.

Dr. Wm. T. Shoemaker, who has just returned from France, has been elected Chairman of the Ophthalmologic Section of the College of Physicians of Philadelphia.

Dr. and Mrs. L. Webster Fox announce the marriage of their daughter Celia to Mr. Charles Francis Griffith, on Thursday, February the twenty-seventh, 1919.

Dr. Clarence E. Ide, honorably discharged from the Medical Corps of the U. S. Army, has resumed the practice of his specialty at San Diego, California, in the offices formerly occupied by the late Dr. W. Williamson.

Dr. J. A. Hughes, having completed the combined Eye, Ear, Nose and Throat internship at Brooklyn Eye and Ear Hospital, announces his association with Drs. Hill, Howard and Fagin, Suite 930, Exchange Building, Memphis, Tenn.

Dr. Harry Friedenwald, of Baltimore, has left for a six months' sojourn in Palestine, as Medical Advisor for the Sanitary Commission, and also to bring a report from the Medical Department of the Jewish University at Jerusalem.

Dr. Samuel D. Risley, of Philadelphia, has been the recipient of many congratulations upon his having recently passed another milestone of life's journey in greatly improved health, notwithstanding the exactions of a very active private practice.

The President of the College of Physicians of Philadelphia has appointed the following members of the Ophthalmic Section as the Executive Committee: Dr. Samuel D. Risley, Dr. S. Louis Zeigler and Dr. Thomas B. Holloway.

Dr. Sterling G. Ryerson, founder and past president of the Canadian Red Cross Society, has resumed practice in Toronto after four years' work in France and England, and various parts of the American Continent in the interests of the Canadian and American Red Cross Societies.

SOCIETY NOTES.

The Medical Society of the State of California will meet in Santa Barbara on April 15, 16, 17. The Eye, Ear, Nose and Throat Section is preparing a very attractive program.

Dr. G. Oram Ring was recently elected President of the Philadelphia Medical Club, and Dr. Wm. M. Sweet one of the directors. The club now numbers about eleven hundred physicians in its membership.

Dr. L. Webster Fox of Philadelphia, President of the Pennsylvania Home Teaching Society and Free Circulating Library for the Blind, made an appropriate introductory address preceding a lecture by Dr. George Earle Raiguel, upon "What England, France and Italy are Doing for the Blinded Soldier; America's Opportunity," which was held in the Rose Garden of the Bellevue Stratford Hotel, on Wednesday evening, February 5th.

At a meeting of the College of Physicians of Philadelphia, on February 5th, the scientific portion of the meeting was devoted to papers on "Concussion and Injuries of the Eye in Warfare," by Lieut.-Col. George E. de Schweinitz; "Reeducation of the Blind" by Lieut.-Col. James Bordley; "Research Work on the Problems of Aviation" by Major Walter B. Lancaster, and the "Army School of Ophthalmology" by Major Meyer Wiener.

At the meeting of the New York Academy of Medicine, Section on Ophthalmology, January 19th, papers were read by Dr. W. M. Sweet, of Philadelphia, on "Implantation of a Gold Ball"; Capt. Harvey J. Howard, of Boston, "Implantation of a Glass Ball," and Dr. A. N. Alling, of New Haven, Conn., on "Implantation of Fat." Mr. Pierre Gougellmann gave a paper from the standpoint of the artificial eye maker. At its meeting on February 17th, Dr. E. Torok gave the paper of the evening on "Tuberculin in the Diagnosis and

"Treatment of Eye Diseases," with a report of twelve years' experience. This paper was discussed from the standpoint of the general practitioner and of the oculist.

On the 8th of November the opening meeting of the Irish Ophthalmological Society was held in Dublin, after the Montgomery Lecture by Dr. Euphen Maxwell, Mr. James Craig, Belfast, in the chair. The rules were drawn up and adopted, and the following were elected to hold office for the ensuing year:—President, Mr. A. W. Sandford Cook; Council, Messrs. J. B. Story, L. Werner, J. A. Craig, H. C. Mooney, F. H. Crawley; Hon. Sec. and Treasurer, Lt.-Col. T. H. Delany, I. M. S. (retd.).

Mr. Werner exhibited lantern slides of a case of cysticercus, published in the *Transactions of the Ophthalmological Society of the U. K.* (Vol. 23, p. 193), and Mr. Story charts of Fields of Vision in Glaucoma. On the following day patients were shown at the Royal Victoria Eye and Ear Hospital, among others a patient whose case was published in the *Transactions of the Ophthalmological Society*, 1891, page 127, of detachment of the choroid; also two cases of fat implantation, one in Tenon's capsule, and the other in the sclerotic after evisceration, the eye in each case being buphthalmic.

MISCELLANEOUS.

By the will of Mrs. Ada B. B. Dixon the sum of \$1,500 is bequeathed to the Presbyterian Eye, Ear, Nose and Throat Hospital, Baltimore, as a tribute to the memory of Dr. John Dixon.

A Joint Influenza Committee has just been created to study the epidemic and to make comparable, so far as possible, the influenza data gathered by the Government Departments at Washington, D. C.

The Ophthalmic Hospital of St. John in Jerusalem, the only one of its class in Palestine, and used by the Turks as an ammunition store and partly destroyed by them on their retreat, now appeals for assistance to rebuild.

The sum hoped for is 50,000 pounds, to maintain and extend the work.

In the "Paris Letter" to the A. M. A. Journal, there is a report of Dr. F. de Lapersonne on the results obtained since July 15th in the treatment of eye injuries. Eighty-three cases were operated upon. In all but three the operation was performed under procain anesthesia, irrespective of the extent or degree of the intervention. When radiography showed the presence of a foreign body, or of a fracture, he frequently resorted to orbitotomy, making a curved incision (following the rim of bone), which gave free access to the orbit, at the same time insuring the safety of the conjunctiva and the palpebral fissure. He insists that immediate suture of wounds should be the absolute rule in these cases of orbito-ocular wounds which come under the head of urgent surgery.

Harris Turner, M. L. A., will be provincial representative for Saskatchewan for the Canadian National Institute for the Blind. C. W. Holmes, director of the Canadian National Institute, and himself a blind man, recently visited Saskatoon and spent some time with Mr. Turner discussing plans for extending work for the blind in this province. Mr. Holmes purposes, with the approval of the executive committee, to establish at least one home teaching circle in each province. A competitive teacher is to be in charge, who shall not only act in the capacity expressly understood by the term, but also as a local paid representative under the immediate direction of the local member of the Western committee, which will be a center of information and activity. Mr. Holmes said that the plan outlined was the only practicable one to advance rapidly. That such a plan, carried out, would enable him to accomplish more in one year, at less expense, than he could single handed, or even with a competent central staff, in five years. For several years past Mr. Holmes has been in Massachusetts in connection with educational work for the blind. When the institute was established in Toronto, he was called to Canada to take charge of it.

OPHTHALMIC LITERATURE

These lists contain the titles of all papers bearing on Ophthalmology received within the preceeding month. These titles are all in English, some of them modified to indicate more clearly their subjects. These subjects are grouped under appropriate heads, the succession of groups being the same from month to month. In the group the papers are arranged alphabetically usually by the name of the author in heavy-face type. After the subject of the paper (Ill.) indicates the number of illustrations. (Pl.) the number of plates, and (Col. pl.) colored plates illustrating the article. (Abst.) shows that it is an abstract of the original article. (Bibl.) tells that the paper is accompanied by an important bibliography. (Dis.) means that a discussion of the subject is published with it. Under Repeated Titles are indicated additional publication of papers already noticed. To secure the earliest possible notice writers may send copies of their papers, or reprints, to 318 Majestic Bldg., Denver, Colorado.

DIAGNOSIS.

- Alger, E. M.** A New Malingerscope. *Amer. Jour. Ophth.*, v. 2, pp. 112-114.
Berger, E. Binocular Loupe for Examination of Pupil. *Amer. Jour. Med. Sc.*, v. 157, pp. 208-210.
 Report of Committee on Standardizing Test Cards. *Amer. Jour. Ophth.*, v. 2, p. 139.
Tscherning. Visual Acuity in Feeble Light. *Arch. d'Opht.*, v. 36, p. 383.
Von der Heydt, R. Ophthalmoscopy with Red-free Light of Vogt. *Amer. Jour. Ophth.*, v. 2, pp. 122-124, and 152.

THERAPEUTICS.

- Paraspecific Therapy in Ophthalmic Practice. *Med. Rec.*, v. 95, p. 200.

OPERATIONS.

- Gocht.** Disinfection of Hands without Soap. *Clin. Opht.*, v. 22, p. 736.
Guiral, R. Antiseptics for Surgery of Eyes. *Rev. de Med. y Cirurg.*, Dec. 10, 1918, v. 23, p. 645. Abst. *Jour. Amer. Med. Assn.*, v. 72, p. 460.
Lopez, F. Protection of Clothing in Irrigating Eye. *An. de la Soc. Oft.*, v. 1, 1918, p. 101. Abst. *Jour. Amer. Med. Assn.*, v. 72, p. 370.

REFRACTION.

- Koster, W.** Congenital Myopia; with Stationary Buphthalmos; and Myopia with Cyclitis. *Zeit. f. Augenh.*, v. 35, pt. 1. Abst. *Clin. Opht.*, v. 22, p. 727.
Tscherning. Optical System in General. Abst. *Arch. d'Opht.*, v. 36, p. 383.

OCULAR MOVEMENTS.

- Argañaraz, R.** Vestibular Nystagmus. *Prenza Med.*, v. 5, 1918, p. 169. Abst. *Jour. Amer. Med. Assn.*, v. 72, p. 531.
Barbieri, A. Complex Ocular Nystagmus. *Prenza Med. Argentina*, v. 5, p. 165. Abst. *Jour. Amer. Med. Assn.*, v. 72, p. 531.
Campbell, K. Heterophoria with Special Reference to Flying. *Med. Press*, v. 107, pp. 25-27.
Cohen, S. Essentials of Bárány Test. *New York Med. Jour.*, v. 109, p. 324.
Dudley, W. H. Perspective for Aviators. *Amer. Jour. Ophth.*, v. 2, pp. 119-121.
Fournier, J. C. M. Ophthalmoplegia of Malarial Origin. *Rev. Med. del Uruguay*, v. 21, p. 626, Oct., 1918. Abst. *Jour. Amer. Med. Assn.*, v. 72, p. 460.

- Kearney, J. A.** Correction of Cross-Eye Deformity. *Amer. Jour. Ophth.*, v. 2, pp. 124-126.

- Suffa, G. A.** Convergence and Convergence Insufficiency. *Jour. Amer. Inst., Homeop.*, v. 11, pp. 900-908.

- Repeated Titles. **Britto.** (v. 1, p. 811.) *Arch. d'Opht.*, v. 36, p. 379.

CONJUNCTIVA.

- Allport, F.** Fourteen Points Concerning Ophthalmia Neonatorum. *Illinois Med. Jour.*, v. 35, p. 64.

- Eaton, F. B.** Scar Tissue Conjunctivitis in Animals; Relation to Trachoma. *Amer. Jour. Ophth.*, v. 2, pp. 81-86.

- Gifford, H.** Diagnosis of Chronic Ophthalmia. *Nebraska State Med. Jour.*, v. 4, p. 53.

- Kirkpatrick, H.** Trachoma. Report of Government Ophth. Hosp., Madras, India, 1917. *Indian Med. Gaz.*, Dec., 1918, p. 459. Gonorrheal Infection. Rep. of Gov't. Ophth. Hosp., Madras, India, 1917. *Indian Med. Gaz.*, Dec., 1918, p. 458.

- Mason, A. B.** Treatment of Gonorrheal Conjunctivitis. Report of Cases. *South. Med. Jour.*, v. 12, p. 44.

- Paterson, R. C.** Granular Tuberculous Conjunctivitis Treated by Instillations of Tuberculin. *Amer. Jour. Med. Sc.*, v. 157, pp. 198-201.

- Simon de Guilleuma, J. M.** Electroionization and Radium in Vernal Conjunctivitis. *Clin. Opht.*, v. 22, pp. 706-714.

- Turner, H. H.** Etiology of Phlyctenular Ophthalmia. *Amer. Jour. Ophth.*, v. 2, pp. 115-118.

- Repeated Titles. **Penichet.** (v. 1, p. 541.) *Espana Oftal.*, v. 4, pp. 25-35. **Sakai.** (v. 1, p. 388.) *Amer. Jour. Ophth.*, v. 2, p. 66.

CORNEA AND SCLERA.

- Cassimatis.** Congenital and Familial Simple Cyanosis of Sclera. *Clin. Ophth.*, v. 22, pp. 714-717.

- Clapp, C. A.** Interstitial Keratitis. *Amer. Jour. Ophth.*, v. 2, p. 58.

- Kearney, J. A.** Serpiginous Ulcer of Cornea. *Charlotte Med. Jour.*, Feb., 1919, p. 66.

- Kirkpatrick, H.** Corneal Inflammation. Rep. of Gov't. Ophth. Hosp., Madras, India, 1917. *Indian Med. Gaz.*, Dec., 1918, p. 458.

- Miller, H.** Scleritis and Episcleritis. *Amer. Jour. Ophth.*, v. 2, p. 137.

Wardenburg, P. J. Congenital Pigmentation of Cornea. *Nederl. Tijdschr. v. Geneesk.*, Nov., 1918, p. 1741. *Abst. Jour. Amer. Med. Assn.*, v. 72, p. 616.

Weekers, L. Thermotherapy of Corneal Ulcers. (6 ill.) *Amer. Jour. Ophth.*, v. 2, pp. 87-91.

ANTERIOR CHAMBER AND PUPIL.

Barrie, T. S. Inequality of Pupils. *Brit. Med. Jour.*, Nov. 8, 1918. *Abst. Med. Rec.*, Jan. 4, 1919.

Tournay, A. Inequality of Pupils and Anisocoria and the Cervical Sympathetic. *Bull. de l'Acad. de Méd.*, v. 80, pp. 486-488.

UVEAL TRACT.

Marin Amat, M. Traumatic Irido-Choroiditis and Syphilis. *Clin. Ophth.*, v. 22, pp. 717-722.

Risley, S. D. Diseases of Uveal Tract. *Amer. Jour. Ophth.*, v. 2, pp. 104-112.

Weekers, L. Iritis After Spirochetosis Ictero-hemorrhagica. *Arch. d'Ophth.*, v. 36, pp. 347-352.

SYMPATHETIC DISEASE.

Rousseau, R. Sympathetic Ophthalmia. *Ann. d'Ocul.*, v. 155, p. 574.

Chailous, J. Sympathetic Ophthalmia. *Ann. d'Ocul.*, v. 155, pp. 571-573.

GLAUCOMA.

Alonzo, A. Lagrange and Elliot Operations in Glaucoma. *Third Natl. Med. Cong.*, Mexico, Puebla, 1918.

Constantin, G. Glaucoma. *Arch. d'Ophth.*, v. 36, pp. 353-356.

Kirkpatrick, H. Glaucoma. *Rep. of Gov't. Hosp., Madras, India, 1917.* *Indian Med. Gaz.*, 1918, p. 456.

Santos Fernandez, J. Glaucoma and Dacryocystitis; Iridectomy. *Rev. Med. Cubana*, Aug., 1918, v. 29, p. 407.

Repeated Titles. *Magitot.* (v. 1, p. 158.) *Amer. Jour. Ophth.*, v. 2, p. 65.

CRYSTALLINE LENS.

Kirkpatrick, H. Operation for Cataract at the Madras Ophthalmic Hospital. *Rep. of Gov't. Ophth. Hosp., Madras, India, 1917.* *Indian Med. Gaz.*, 1918, p. 452.

RETINA.

Goldsmith, H. Dilatation of Retinal Veins and Arteries. *Roy. Soc. Med., Sec. on Ophth.*, Nov. 6, 1918. *Abst. Amer. Jour. Ophth.*, v. 2, p. 56.

Jervey, J. W. Hyperplastic Exudative Retinitis (Nonhemorrhagic). *Amer. Jour. Ophth.*, v. 2, pp. 127-135.

Jocqs, R. Treatment of Detachment of Retina. *Clin. Ophth.*, v. 22, pp. 691-697.

Onfray, R. Diabetic Retinitis. (3 ill.) *Ann. d'Ocul.*, v. 155, pp. 553-570.

Wassenaar, T. Light Phenomenon Thru Closed Lids. *Nederl. Tijdschr. v. Geneesk.*, v. 2, p. 1412. *Abst. Jour. Amer. Med. Assn.*, v. 72, p. 386.

TOXIC AMBYLOPIAS.

Fehr, H. Tobacco Amblyopia in Germany. *Berl. klin. Woch.*, v. 55, pp. 854-855.

Haas, H. K. de. Dangers from Arsenic in Daily Surroundings. *Geneeskundige Bladen*, v. 20, No. 2. *Abst. Amer. Jour. Ophth.*, v. 2, pp. 61-64.

OPTIC NERVE.

Britto de, V. Optic Neuritis with Intracranial Affections. *Abst. Arch. d'Ophth.*, v. 36, p. 380.

Kirkpatrick, H. Optic Atrophy. *Rep. of Gov't. Ophth. Hosp., Madras, India, 1917.* *Indian Med. Gaz.*, Dec., 1918, p. 457.

Kornder, L. H. Hydrocephalus and Choked Disc in Dogs. *Arch. of Internal Med.*, v. 23, pp. 197-219.

Pancoast, H. K. Roentgenologic Contribution to Cause of Hereditary Optic Atrophy. *Amer. Jour. of Roentgenol.*, v. 6, pp. 17-23.

Santos Fernandez, J. Importance of Treating Optic Neuritis Even of Long Standing. *Cron. Med. Quirurg.*, v. 44, p. 490. *Abst. Jour. Amer. Med. Assn.*, v. 72, p. 459.

Vail, D. T. Monocular Retrobulbar Neuritis from Hyperplasia of Ethmoid Bone. *Amer. Jour. Ophth.*, v. 2, pp. 96-104.

VISUAL TRACTS AND CENTERS.

Conlon, F. A. Bitemporal Hemianopsia Due to Sinus Disease. *Amer. Jour. Ophth.*, v. 2, pp. 92-95.

Mirallié, C., and Denès. Mirror Writing. *Bull. de l'Acad. de Méd.*, v. 80, p. 638. *Abst. Jour. Amer. Med. Assn.*, v. 72, p. 526.

Mairet, A., and Durante, G. Modification of Visual Field from Shell Concussion. *Presse Méd.*, v. 26, p. 611.

COLOR VISION.

Verry-Westphal, A. The Anomaloscope and Examination of Color Perception. (5 ill.) *Clin. Ophth.*, v. 22, pp. 697-706.

Repeated Titles. *Collins.* (v. 1, p. 814.) *Amer. Jour. Med. Sc.*, v. 157, p. 303.

EYEBALL.

Fernando Aparicio, D. Panophthalmitis. *España Oft.*, v. 4, pp. 35-37.

Garcia Mansilla. Metastatic Ophthalmia and Diabetic Anthrax. *España Oft.*, v. 4, pp. 38-40.

Lister, A. J. E. Treatment of Panophthalmitis. *Indian Med. Gaz.*, v. 54, pp. 17-18.

LACRIMAL APPARATUS.

Bistis, J. Mycosis of Lacrimal Canaliculus. (Bibl.) *Arch. d'Ophth.*, v. 36, pp. 362-365.

Kirkpatrick, H. Extirpation of Lacrimal Sac. *Rep. of Gov't. Ophth. Hosp., Madras, India, 1917.* *Indian Med. Gaz.*, Dec., 1918, p. 459.

Würdemann, H. V. Silver Preparations in Lacrimal Sac Disease. *Amer. Jour. Ophth.*, v. 2, p. 71.

Repeated Titles. *Achard and Leblanc.* (v. 2, p. 79.) *Arch. d'Ophth.*, v. 36, p. 378.

LIDS.

Begle, H. L. Congenital Ptosis. *Jour. Michigan State Med. Soc.*, v. 18, p. 55.

- Clarke, E. A. Eyelash in Canaliculus. Note in Jour. Amer. Med. Assn., v. 72, p. 594.
 Duhamel, A. Operative Treatment of Entropion of Upper Lid. Ann. d'Ocul., v. 155, pp. 575-577.

ORBIT.

- Beauvieux. Traumatic Emphysema of Orbit. (1 ill.) Arch. d'Opht., v. 36, pp. 366-368.
 Lagrange, F. Preparing Orbit for Artificial Eye. Bull. de l'Acad. de Méd., Dec. 24, 1918, v. 80, p. 641.

TUMORS.

- Argañaraz. Diffuse Glioma of Retina, Telangiectasis. (1 ill., Bibl.) Arch. de Oftal. Hisp.-Amer., v. 18, pp. 565-576.
 Berner, O. Sarcoma of Iris. (1 ill.) Norsk. Mag. for Laegevidenskab, v. 79, pp. 1373-1380.
 Conjunctival Melanotic Tumors. New York Med. Jour., v. 109, 1919, p. 292.
 Golovine, S. S. Benign Intradural Tumors of Optic Nerve; Operative Treatment. (8 ill., Bibl.) Arch. d'Opht., v. 36, pp. 321-347.
 Friedenwald, H. Sarcoma of Iris. Amer. Jour. Ophth., v. 2, p. 58.
 Pearce. Carcinoma of Orbit. Amer. Jour. Ophth., v. 2, p. 58.
 Recurring Growth at Limbus. Dis. Amer. Jour. Ophth., v. 2, p. 58.
 Repeated Titles. Carreras. (v. 2, p. 175.) Arch. de Oft. Hisp.-Amer., v. 18, pp. 585-590.

INJURIES.

- Gibson, J. L. Perforating Injury of Both Eyes. Med. Jour. Australia, Dec. 14, 1918, p. 492.
 Lapersonne, F. de. Results of Treatment of Orbital Ocular Wounds. Bull. de l'Acad. de Méd., v. 80, pp. 613-618.
 Early Treatment of Wounds of Eyes. Bull. de l'Acad. de Méd., Dec. 17, 1918, v. 80, p. 613. Abst. Jour. Amer. Med. Assn., v. 72, p. 436.
 Pearce. Destruction of Lid. Amer. Jour. Ophth., v. 2, p. 58.
 Pickard, H. L. Ocular Action of Dichlorethylsulphid, Mustard Gas. Amer. Jour. Ophth., v. 2, p. 136.
 Schmeichler, L. The Blind in Warfare. Wien. med. Woch., Oct. 9 and 16, 1918. Abst. Med. Rec., Jan. 25, 1919, p. 163.
 Valois, G. Monocular Blindness of War; Prothesis. (8vo, 230 pp., 27 ill., 25 pl.) Abst. Arch. d'Opht., v. 36, pp. 380-382.

PATHOLOGY.

- Riddle, O., and La Mer, V. K. Post-mortem Melanin Pigment Formation in Pigmentless Retinas and Choroids of White Ringdoves. Amer. Jour. Physiol., Baltimore, 1918, v. 47, pp. 103-123.

GENERAL DISEASES.

- Bram, I. Successful Therapy in Exophthalmic Goitre. New York Med. Jour., v. 109, pp. 314-321.

- Burger, H. Lethargic Encephalitis. (Bibl.) Arch. d'Opht., v. 36, pp. 356-361.
 Fernandez, F. M. Ocular Tuberculosis. Cron. Med. Quirurg. de la Habana, Sept., 1918, v. 44, p. 500. Abst. Jour. Amer. Med. Assn., v. 72, p. 459.
 Gardini, A. Tuberculin in Ocular Tuberculosis. Cron. Med., v. 35, 1918, p. 293. Abst. Jour. Amer. Med. Assn., v. 72, p. 530.
 Kearney, J. A. Distressing General Affections Traceable to Eye Conditions. Med. Rec., v. 95, p. 279.
 Lian, C. Sign of Incipient Exophthalmic Goitre. Presse Méd., v. 26, p. 655. Abst. Jour. Amer. Med. Assn., v. 72, p. 527.
 MacNalty, A. S. Lethargic Encephalitis. Brit. Med. Jour., Jan. 11, 1919, p. 49.
 Osborne, E. S. Ductless Glands in Relation to Eye. Jour. Med. Soc. Georgia, v. 8, pp. 164-166.
 Pacheco Luna, R. Ocular Lesions After Antityphoid Vaccination. (Bibl.) Arch. de Oft. Hisp.-Amer., v. 18, pp. 577-585.
 Platero. Ocular Symptoms in Toxemia of Pregnancy. España Oft., v. 4, pp. 40-43.
 Sztark, C. H. Xerophthalmia in Infant from One-sided Diet. Arch. de Méd. des Enfants, v. 22, p. 1. Abst. Jour. Amer. Med. Assn., v. 72, p. 611.
 Wylie, A. W. Ocular Complications in Osteomyelitis Encephalitis and Meningitis. Lancet, Feb. 1, 1919, p. 178.

HYGIENE.

- Crookes' Lenses. Corresp. in Lancet, Jan. 18, 1919, p. 124.
 McCurry, W. T. Preventable Blindness. Jour. Arkansas Med. Soc., v. 15, pp. 166-169.

OPHTHALMIC SOCIOLOGY AND HISTORY.

- Collins, E. T. Teaching Ophthalmology to Medical Students. Edinburgh Med. Jour., v. 22, pp. 48-51.
 Dimmer. A New Braille System for the Blind. Clin. Ophth., v. 22, p. 735.
 Fergus, F. Place of Ophthalmology in Medical Curriculum. Edinburgh Med. Jour., v. 22, pp. 52-60.
 Hancock, S. H. Military Ophthalmology. Canadian Med. Assn. Jour., v. 9, pp. 108-128.
 Jackson, E. German Ophthalmology. Amer. Jour. Ophth., v. 2, pp. 68-71.
 Kirkpatrick, H. Report of the Government Ophthalmic Hospital, Madras, India, 1917. Indian Med. Gaz., Dec., 1918, v. 53, pp. 452-459.
 Loeb, C. Post-War Aviation. Amer. Jour. Ophth., v. 2, p. 72.
 Paterson, J. V. Teaching of Diseases of the Eye to Medical Students. Edinburgh Med. Jour., v. 22, p. 64.
 Reeducation of the Blind. Med. Rec., v. 95, p. 285.
 Sym, W. G. Teaching of Eye Diseases in Curriculum. Edinburgh Med. Jour., v. 22, pp. 60-64.